MODERN
THEATRE PRACTICE

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MODERN THEATRE PRACTICE

MODERN THEATRE PRACTICE — A Handbook for Non-Professionals

By HUBERT C. HEFFNER, *Northwestern University,*
SAMUEL SELDEN, *The University of North Carolina*
and HUNTON D. SELLMAN, *University of Iowa*

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PREFACE

THE love of the theatre in the American people has given us today a preëminent position among nations of the world in the support of that institution and its art. Even in the early days of Colonial America, when fanatic Puritans damned it as the devil's drawing-room and its actors as minions of Satan, it grew in popular favor year by year. Brought across the sea as a part of our English heritage, the theatre received its first welcome in the South, spread rapidly to the North, and followed the receding frontier westward into pioneer settlements and mining camps. Today we are among the most devoted theatre-going people in the world. Day after day, night after night, hundreds of thousands of city and country folk crowd into cinemas to satisfy their love of the theatre. The cinema is to these people what the popular theatres, the bear-pits and bull-rings, were to the Elizabethans, and the circus to the Romans. It has been said with sarcastic intent that the cinema is America's National Theatre. In part it is, but only in part. There is another part in our professional, our "Broadway" theatre, but a far larger part is in our non-professional or little theatres. Scattered throughout the length and breadth of this land, in cities, towns, hamlets, universities, high schools, churches, lodges, department stores, factories, settlement houses, rehabilitation camps, in every sort of community or organization where people are gathered together, there is a little theatre making life for men and women less drab, more bearable, extending the boundaries of living through the dreams raised with a few hours' traffic upon the stage. To the dull, prosaic commonplaceness of every-day living, to the hopeless tedium of poverty-stricken labor, to the satiety and boredom of wealthy idleness, this free theatre of the whole people has often brought a brief respite, a momentary lifting of the burden. This, the little or amateur theatre, is really the free democratic National Theatre of America, amateur in the original sense of the word from which it derives — *amator*, lover.

Out of just such an amateur theatre developed the institution that bore and fostered the art of Aeschylus, Sophocles, Euripides, and Aristophanes. Out of such another amateur theatre in medieval Europe came the theatre and drama of Shakespeare and Molière; and out of the modern, free, amateur theatre in Europe and America have come the greatest contemporary playwrights, directors, actors, artists, and technicians — those who have produced a renascence in the theatre and brought forth a new conception of its art, a modern theatre practice.

This conception views the whole art of play production as a planned and orderly execution of a beautiful and effective design. Within this design all the elements of a performance — acting, scenery, lighting, properties, music, dancing — are harmonized and orchestrated toward producing in the audience an aesthetically satisfying emotional effect. Under this conception the performance of a play is to be compared to the performance of a symphony by a large and well-trained orchestra, under the guidance of a skilled conductor. No single musician, whatever instrument he plays, is unworthy of attention and training, or may be allowed to play out of harmony. Likewise in the modern theatre practice no single element in the production of a play may be left unconsidered or allowed to make an inharmonic disturbance in the symphonic effect of the whole. In this there is no question of relative importance; every element is important, for the play — the whole performance — is the thing.

To discuss thoroughly all of the problems of producing plays within a single volume is obviously an impossible task. To treat these problems superficially would be no novelty. In this volume the discussion is limited to three of the most important aspects of production: directing, scenery, and lighting, in order to cover each of these subjects more thoroughly than is often done in text books concerned with play production. At the same time the discussion in each case is elementary and comparatively brief, because the book has been planned as a text book for college courses in play production. The material presented and the organization adopted will, however, make it useful as a reference book for directors and other workers in the nonprofessional theatre, and for high school courses in dramatics. Towards those ends the basic fundamentals of directing and production have been treated in a simple and thorough manner. Again it may be repeated, the book is not intended to be a completely exhaustive treatment of directing, scenery, or lighting. Such a treatment would require many volumes.

Nor has it been the intent of the authors to write a manual that would supplant the teacher. The book should be used as a basis of class discussion and in conjunction with actual practical work in the theatre. In this way it may become a manual and guide to students in the theatre and workshop and a text serving as a basis for lectures and elucidations by the teacher in the classroom. The best results will be obtained when students are assigned practical projects in conjunction with portions of the text under study. Thus, when the class is studying the problems of play selection, each student should be required to prepare a program of plays that may be produced in the theatre and community with which he is familiar. In the study of the designing of the production, each student should be required to make a thorough study of an acceptable play, design a complete production of that play, and incorporate his results in a complete Prompt Book or Director's Copy. In the same way the study of the construction of a flat should be accompanied with the actual building of a standard flat. Used in this way the book becomes not a text to be memorized and recited, but an actual practical guide to be used in the theatre and shop. As such it was designed and written.

The authors have actively collaborated in the preparation of this volume. Each, however, is more definitely interested in and has specialized in the teaching of the subject matter in the main division of the book for which he is mainly responsible. Part One presents and discusses the nature of the task confronting the director of a theatre; Part Two, the method of designing and building the scenery for a production; and Part Three, the designing of the lighting equipment and the selection and use of the equipment in executing the design. Professor Heffner is primarily responsible for Part One, Professor Selden for Part Two, and Professor Sellman for Part Three.

The author of Part One wishes especially to acknowledge his indebtedness to Ruth Penny Heffner, without whose assistance this section could not have been finished in its present form. From the inception of this Part she has actively collaborated in its completion. He wishes, also, to thank Mr. Gilmor Brown, Supervising Director of the Pasadena Community Playhouse, and Professor Garrett H. Leverton, Director of the University Theatre, Northwestern University, for permission to reproduce photographs of their productions.

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PART ONE

CHAPTER I

THE DIRECTOR AND THE ORGANIZATION

A. The Director

The director as we know him in the theatre today is a relatively new comer. If the authority of the *New English Dictionary* may be relied upon, the word itself as applied to a theatre person was not current before 1880. In England even today the term stage-manager, or sometimes producer, is more frequently used to denote that individual known in American theatres as the director. But however new the appellation and position may be, certain of the duties commonly associated with that position are as old as the professional theatre itself. Some person or persons have always had to take the responsibility for the selection of a play, the assignment of parts, the rehearsing in so far as it was done, and the assembling of the necessary elements of the setting for the performance of the play before the audience. During the history of the theatre the performance of these duties has shifted from person to person.

Judging from the following excerpt from Chapter X of Macready's *Reminiscences*, the development of the position of the modern director had not proceeded very far before 1817:

> It was the custom of the London actors, especially the leading ones, to do little more at rehearsals than read or repeat the words of their parts, marking on them their entrances and exits, as settled by the stage-manager and their respective places on the stage. To make any display of passion or energy would be to expose one's self to the ridicule or sneers of the greenroom, and few could be more morbidly sensitive to this than myself. But the difficulty of attaining before an audience perfect self-possession, which only practice can give, made me resolve to rehearse with the same earnestness as I would act; reasoning with my-

> self that if practice was of the value attributed to it, this would be a mode of multiplying its opportunities, of proving the effect of my performance, and of putting myself so much at ease in all I might intend to do that the customary nervousness of a first night would fail to disturb or prevent the full development of my conceptions. Upon making the experiment I may quote Dryden's line, " 'T is easy said, but oh! how hardly tried!" I found it much more difficult to force myself to act in the morning with the cold responses and the composed looks of Miss O'Neill, Young, and the rest, than at night before the most crowded auditory. Frequently in after-years when I have given certain directions to actors rehearsing, the answer has been, "Sir, I never can act at rehearsal, but I will do it tonight." To which I had only one reply, "Sir, if you cannot do it in the morning, you cannot do it at night; you must then do something because you must go on, but what you cannot do now, or cannot learn to do, you will not be more able to do then." The task I found a very hard one, but I fought successfully against my *mauvaise honte*, and went doggedly to it. By this means I acquired more ease in passing through the varieties of passion, confirming myself in the habit of acting to the scene alone, and, as it were, ignoring the presence of an audience, and thus came to wield at will what force or pathos I was master of.

Macready's advice and practice were radical departures in the first half of the nineteenth century, but it was through his reforms and those of Madame Vestris and the Bancrofts that the director or stage-manager somewhat as we know him today emerged in England. The new realism and the spectacular staging of the melodramas furnished definite impetus toward and motivated the development of the art of directing. But it was left for Germany and Russia to foster and mature the art. The work of Wagner and Appia at Bayreuth, the disciplined performances of the Meininger troupe in their tours through Europe, the experimental productions of the Free Theatres of France and Germany, the writings of Gordon Craig, and, perhaps greater than any of these, the work of Stanislavsky and the Moscow Art Theatre, aided in defining and developing the new conception of dramatic art and in bringing forth the modern director—the *régisseur*. His is indeed a new position in the theatre that could not have possibly been conceived under the old idea of play production. With all the reforms of

Macready, Vestris, and the Bancrofts, the director remained in England, even in the time of Sir Henry Irving, primarily a mere stage-manager who supervised the assembling of related but far from harmonized parts. Under that conception of dramatic production the playwright was often asked to make from the latest foreign importation a hasty concoction that had no literary or artistic value. It was cast according to type with the stock actors in all but the leading parts, which were reserved for the stars. The scene-painter refurbished or rebuilt old stock sets that were made to serve as well for this play as for any other. Lighting offered even fewer difficulties and did not need to be considered until the night of the performance, when footlights, spotlights, and border strips would be turned on almost at the light-man's discretion. The wardrobe-mistress, when there was one, often provided costumes according to the demands and taste of the individual, especially for the star, rather than according to the requirements of the rôle. There were some rehearsals for the actors under Macready, Vestris, and the Bancrofts, but even they would not have thought it necessary to design and rehearse the elements of production as well. The rather indiscriminate putting together of the resources of playwright, actors, scene-painters, light-man, costumer, and property man, constituted a performance under the pre-modern conception. The director's task was merely to see that these were assembled in approximately the right order on the night of performance, and to rehearse the actors. It is to be feared that this same conception of production prevails all too frequently in many little theatres today.

Nevertheless, whether these little theatres are aware of it or not, a renascence has taken place in the drama and the theatre. Through the work of those pioneer organizations and artists mentioned above, along with a host of playwrights and other artists in and out of the theatre, the production of a play has become an art. Under this new conception all the elements of the theatre, speech and song and dance, light and color and form, mass and movement and rhythm, technician and actor and artist, are molded and woven into an harmonious and artistic whole under the supervision and guidance of the director. He and his colleagues design and perfect every part of the whole. Like the great conductor of a mighty orchestra, he harmonizes in sweet concourse every single element, however small. Under his trained guidance all the vast complexity of the modern theatre and of modern production is made to operate in smooth and orderly form. He is the artistic director of artists. Such is the great director, the *régisseur*—Stanislavsky, Reinhardt, Copeau, to mention only three of Europe.

To discuss in orderly fashion and in concrete terms the art of the director is, therefore, very difficult. So much of it, like all true art, is elusive and indefinable. So much is dependent upon artistic insight and ability, which vary from director to director. But as other arts, that of the director can in its fundamentals be taught and learned. His artistic results are accomplished through a regular, orderly process just as are those of the painter, the musician, the poet. The minutiæ of the process, indeed the whole process, may vary from artist to artist, and yet each be right in his manner of directing. Perhaps, in the last analysis, every great artist will, though working at first by rule and imitation, eventually make the process which he follows individual and peculiarly his own. In play directing, moreover, the process may vary somewhat from play to play, according to the demands of each. This being true, there is no place for dogmatizing. The major steps in the process, however, are similar, and amenable to discussion and explanation. The duties of the little-theatre director also vary, and may include many besides the directing of plays. In some instances he has to do everything that pertains to his theatre, the organizing of the group, writing, casting, and acting in his own play, directing inexperienced actors, painting scenery, advertising the performances, selling season tickets, sewing costumes—he has literally to be a jack of all trades. In other instances, like most directors in the professional theatre, he has nothing to do but rehearse the actors in the performance of their rôles, his work ending with the opening of the show. Some directors have to perfect productions with only ten days of preparation; others may be able to take months for the work. There is no uniformity to be found, or to be desired, in anything pertaining to the little theatre. Only in its technical work does it approach uniformity in any degree, but even there practice varies widely. In Part One of this book, which is devoted to a discussion of the director, the organization, and the process of directing a play, the aim is to be suggestive rather than arbitrary. The general question to be answered may be stated thus: Assuming that a community or an institution with a well-equipped theatre called in a trained director to take charge of that theatre, what would be a good procedure for him to follow, especially with reference to selecting, casting, and rehearsing plays?

1. *The Duties of the Director of a Little Theatre*

In the professional theatre in America today, the producer or producers of a play usually hire a director to prepare it for production. His contract may require of him nothing more than the training of the actors through the rehearsals, with perhaps some advice or suggestions to the other artists upon the various elements of production. After four or more weeks of rehearsals, his task is done when the show opens, or at least after it settles down to a steady run. He is then at leisure until he secures a contract to direct another production. In actual practice, of course, many professional directors do far more for the productions than is here indicated. Some little theatre organizations also make a practice of hiring a professional director for single productions. In general, however, the position of director in a nonprofessional organization is far more exacting than the mere preparation of a single production, arduous as that may be. Before he can begin the production of plays, he must organize the whole theatre and a production staff. Frequently he has to promote and develop the organization in the community or institution in which he is working, and as long as he maintains his connections with it, he has to guide and foster it. Often he may find himself the only trained stage technician and artist in the organization, and may therefore have to train all his assistants and supervise the whole work of production while they are receiving instruction from him. At the same time that he is selecting, casting, and rehearsing plays, promoting and advertising the organization and the work, equipping and superintending the theatre, he may be required to design the whole setting, don a smock and help to construct and paint scenery, sew costumes, build and assemble properties, and manipulate lighting equipment. If his position and organization are in an academic institution, along with his duties as director of the theatre, he will probably be teaching a full schedule of classes. In any organization he will have to adjust differences of opinion, compose disagreements, and build a morale within the group. The duties of the director of a little theatre cannot be more specifically defined, for they vary according to the organization in which he works. In any event they will be sufficiently exacting.

2. *The Requisites of a Good Director*

The director, then, of a nonprofessional theatre organization today must be a versatile and accomplished person. His position will require of him not only knowledge and training in the arts of production and directing, but also ability in organization and management, qualities of leadership, and a forceful as well as pleasing personality. He should be an individual who commands the respect of his co-workers and inspires their confidence. The statement has been made by an eminent English critic that it is only those ignorant directors of weak personality who have to resort to shouting at and abusing the members of their casts. Certainly a director who knows thoroughly what he is doing and has the ability to impart this knowledge to others does not have to resort to such means to accomplish his purpose with intelligent people. Courtesy and good manners are just as necessary and charming in the theatre as in the drawing-room.

But these general qualities alone are not sufficient equipment for the good director. To qualify in that category he must have training and experience. It is perfectly possible to "put on" a play by main strength and awkwardness and sufficient energy. It is being done every day in schools and communities throughout America; with that type of director and production this book is not concerned. What the real director of a little theatre will need to know about production and directing is nothing less than the whole process, all there is to know. No matter how many trained and efficient assistants he may have backstage, as the final authority on the staff he must be able to guide them, to discuss with them the various phases of production for which each is responsible, and to judge their work and explain wherein it fails or succeeds. Seldom is a director an expert in every phase of production, but he must know the rudiments of each. His sole duty in an efficiently organized and staffed theatre, so far as the actual production is concerned, may be the training of the actors through rehearsals for that production, but before he can do this, he must design the production—that is, he must determine what effect is aimed at in the production and what general means are to be used to produce it. He cannot do this if he is entirely ignorant of the design and execution of scenery and lighting, costumes, and properties. Neither can he train actors without a knowledge of the art of acting. Perhaps every director need not be an actor, but he must know, by some means or other, the theatre and its audience from the standpoint of the actor. The nature of the equipment and training of a director will become more clear as the details of his duties are discussed. Incomplete as is this resumé, it may be concluded with the noting of one further factor in the director's qualifications. In addition to knowing the theatre in a practical way, he must know drama. He should not only have a wide reading knowledge of plays of all periods and countries, but he should also know dramatic technique and structure. Much of this knowledge he may acquire by his own initiative and application; other parts of it will come only with actual experience in a producing theatre.

B. Organization and Management

If the thousand and one things that must be done in the orderly and regular production of plays are done efficiently and on time, the director must have a suitable and well coördinated organization. The first task confronting him, then, is that of organization. He must be a business man, an organizer, before he can be an artist. Lack of proper and efficient organization is a disease that kills many little theatres; it is the disease, too, which often accounts for that sickly pale look of mediocrity that characterizes many of their performances. The wise director will work to perfect a coördinated and efficient general organization and to organize a competent and efficient production staff. His wisdom will lead him to a no less careful planning of the production of each play during the season, for it will soon tell him, or sad experience will teach him, that the art of directing must be an orderly and methodical process.

In the development and management of his organization, fortunately, the director is able to call upon a large fund of experience and advice. The experience of similar organizations in other institutions and communities, which are inspiringly related in Kenneth Macgowan's *Footlights Across America,* will provide countless stimulating suggestions. The sound practical advice in *Making The Little Theatre Pay,* by Oliver Hinsdell, formerly director of the Dallas Little Theatre, and the suggestions in Alexander Dean's *Little Theatre Organization and Management,* equally sound and practical, will give him a definite procedure to follow, especially with regard to the general organization. Sanford E. Stanton's *Theatre Management* will provide an outline of the organization of the professional theatre, and valuable suggestions on the business aspect of management. Further, through the study of successful community and public organizations of other types, he will be able to learn much that is applicable to the theatre. From the methods and organization of such civic institutions as the Y.M.C.A., the Community Chest, churches, music and art groups, he may derive many ideas of procedure. The exact methods of successful business enterprises, their carefully kept records, their systems of checking and auditing, their consistent encouragement of public good will, are examples worthy of his consideration. From the methods of promoters of public affairs, charity drives, and advertising campaigns, the director may learn some things to do and much to avoid.

In general, the organization of the nonprofessional theatre may be divided into two major divisions: The general organization, which varies greatly from theatre to theatre; and the production organization, which is somewhat similar in every theatre.

3. *The General Organization*

By the general organization of a theatre is meant that larger enveloping and controlling group of individuals who are concerned with the little theatre as a community enterprise. In theatres organized within schools, churches, lodges, and other institutions, the general organization consists of the officers and governing boards of those institutions. Sometimes these institutions set up special committees or boards for the government and supervision of the theatre organization. For example, The Carolina Playmakers of the University of North Carolina has nominally at its head a Board of Incorporators, of which the director is chairman. This Board is regularly organized, holds annual meetings, and hears complete reports. In other institutions a Committee on Dramatics exercises a similar governing function. Many of the community theatres, however, have developed elaborate general organizations, made necessary by the complexity of their undertakings. Usually at the head of these organizations is a board of directors, supervisors, or governors. This board is composed of interested and influential citizens of the community, who may or may not have supplied the capital upon which the organization operates, or who may have underwritten the necessary funds. In some communities where theatres have been erected, there is a separate bond-holding committee; often, however, the two committees are combined. This governing committee hires the director, hires or sanctions the hiring of all other paid officials, makes out the budget for the year, audits the accounts, conducts the season ticket sale and any campaign for funds, and often determines the nature and details of the season's program. The director may be a member of this committee, but in some instances he is not. Usually working directly under the authority of the committee is a business manager who is in charge of the whole organization known as the "front of the house," as well as of the advertising and press notices, ticket sales, purchases, and all other business transactions. In some instances, however, there is a treasurer who handles all income and expenditure. The duties of the business manager will be more fully outlined along with the duties of the members of the director's staff, for his is a necessary and important part of this organization.

Such an organization, as has been indicated, leaves the director free to devote his whole time to the direction and production of plays. Sometimes, however, it operates to make him merely a hired man tied hand and foot to the whims of a board, the members of which cannot agree. Such an intolerable situation has in several instances forced good directors to give up their positions in disgust. In the majority of cases, though, the director is a prominent member of the governing body. Indeed, in many instances, it is through his effort that it, and even the theatre came into being. In the early beginning he may have had to perform all the duties that devolve upon the director of the average nonprofessional theatre organization. Until his initiative and effort had built a large organization, he had to be his own governing board, business manager, director, and leading staff member of the production organization. Perhaps he was entirely dependent upon voluntary helpers, whom he had to train and supervise. The school, as well as the community director, as has been emphasized, must be equipped to meet such a situation.

4. *The Organization for Production*

In some organizations and in some discussions the term production is used in a special and restrictive sense to refer to those elements of stage production—scenery, lighting, costumes, and properties—as differentiated from directing and acting. In this sense the production staff is the staff that mounts the play. Without accepting this differentiation throughout, it may be well, for purposes of clarity, to discuss here first, those members of the director's staff who work directly under his authority and are amenable to him for orders; and secondly, those members who work directly under a technical director in the mounting of the play. In a sense, of course, the members of the whole organization within the theatre compose the director's staff. The whole organization should be under the authority of the director, but to certain lieutenants he will have to delegate specific authority in their divisions. While these various positions are described separately, it should be remembered that in every organization there is considerable overlapping. The technical director may also be the associate director of the theatre, or the associate director may also be the business manager.

5. *The Director's Staff*

In the selection of plays and casts, in the management of the organization and the theatre, and in the rehearsing of the plays, the director will require, in addition to the casts, a staff of assistants. Specifically he may utilize a play-reading committee, a casting committee, a business manager with a staff of assistants, associate or assistant directors, prompters, a music director, and a ballet or dancing director.

6. *The Play-Reading Committee*

In some little theatres the play-reading or -selection committee is appointed by and is responsible entirely to the board or governing body of the general organization. Sometimes this committee has absolute determination of the plays to be produced, giving rise in some instances to an unpleasant situation for the director, who may be required to produce a play against his better judgment. In other instances, in which the committee may be appointed by the governing body, the director and the committee each have the power of veto. In organizations in which the duty of selecting the season's program devolves upon the director, as in most cases it should, a play-reading committee of his own choosing is often a valuable asset to him. Besides his immediate assistants, the director in academic institutions will usually find it advisable to place upon this committee interested representatives from various scholastic departments other than his own. In community theatres this committee should include members of the community who have some knowledge of and enjoy reading plays. Such a committee can be of decided assistance in reporting upon plays that may be desirable for production and in aiding the director in estimating the public reception of specific plays produced.

7. *The Casting Committee*

One of the criticisms that every director probably meets in his work is the charge of favoritism or too much repetition in the choice of actors for the plays. In so far as possible he will wisely avoid all grounds or basis for such criticism. In this endeavor a committee for the selection of casts is of great value. This committee should likewise include his trained assistants and competent outside members. Its personnel may remain the same throughout the season, or may vary from play to play. Its duties will be further discussed in the chapter on casting the play.

Some directors find various other committees useful in the organization, but it should be urged that too many and too large committees are a hindrance rather than an aid.

8. *The Business Manager*

As has been stated, the business manager of some little theatres is appointed or hired by and is directly responsible to the governing body of the organization. In some instances the responsibilities of the office are divided between a manager and a treasurer. These responsibilities may be detailed here under the one office. However appointed or to whomever responsible, he must work directly and in harmony with the director. An idea of his duties may be gained from the following outline. The business manager is responsible for:

a. Advertising and selling the performances to the public;

b. Organizing and directing the management of the "front of the house";

c. Preparing the budgets of the theatre, of each play, and of each department;

d. Authorizing or making all expenditures;

e. Keeping the accounts and business records of the theatre, and rendering audits.

This position demands a competently qualified individual. He should have ability as an organizer, know the various mediums of advertising, know how to conduct a publicity campaign, and be familiar with accounting and keeping of business records. Upon him devolves a large and important responsibility. In order that he may discharge it, he should be given full authority in his office, but required to render regular accounts in all departments of his work.

He will need at least two corps of assistants: an advertising staff, and a house staff. The advertising staff, working directly under the business manager, must be capable of producing attractive and effective advertising that will sell the play to the public and yet maintain the dignity of the organization. To do this the staff must be prepared to utilize all the channels of publicity, vocal and written. The house staff will work directly under the authority of a house manager, who is responsible for the "front of the house" during performances. In addition to the house manager, this staff will consist of a cashier in the box office, doorkeepers for the taking of tickets, and ushers for the seating of the audience and distribution of the programs. The members of this staff, too, must be trained to execute their duties in a smooth, efficient, and courteous manner. They are the part of the organization with which the public first and most frequently comes in contact. They should be made cognizant of this and aware that they are the *liaison* between the theatre and the public.

9. *Assistant Directors*

In organizations producing a large and varied program of plays, the director usually has on his staff one or more assistant directors who are capable of directing plays, or who are preparing under his tutelage to become directors. These are often in academic institutions members of the faculty of the dramatics department, or advanced students. Sometimes a student assistant director receives his first training by serving the director as prompter or as stage-manager. When the assistant director is a trained individual, he may or may not hold other positions in the organization.

In addition to those thus far enumerated, the director will need for the rehearsals and performances of each play a prompter, who, it may be repeated, may be also the assistant director of that production. Frequently, also, the prompter serves as assistant stage-manager. In the production of some plays, of musical comedies, and of light operas, the director will require the assistance of a musician in the position of music director. It will be his duty also to assist and advise in the preparation of the programs of entr'acte music. The logical individual for this position is the conductor of the theatre orchestra, if there is one. Likewise, in those productions named above, the services of a trained dancer in the position of dance director are frequently required. Almost every institution or community has trained individuals available for these positions, whose services may be enlisted by the tactful director.

10. *The Production Division*

Using production here in the restricted sense, to mean the mounting of a play, the production division will consist of a technical director, heads of departments with their crews, and a stage-manager who is in charge of all crews during performances. The production division is under the immediate authority and direction of the technical director.

11. *The Technical Director*

The technical director, sometimes called director of production or producing manager, has full charge of and responsibility for the production organization, including the scenery department, the lighting department, the costume department, the property department, and the backstage organization.

It is his duty to organize each of these departments with competent heads and corps of assistants. He is responsible for the ordering and maintenance of all departmental and backstage equipment. Through him the work of each of these departments and of the backstage organization is properly coördinated. He is directly or through his assistants responsible for the designing and construction of the scenery, the designing and making of the costumes, the selection and assembling of the properties, and the designing and executing of the lighting. Working directly under him is a stage-manager responsible for the selection, organization, and efficient operation of the stage crew, and in full charge of the stage during the performances. It is readily apparent from this brief indication of the duties of the technical director that he must be a highly trained man, an artist as well as a technician. He may need to know how to design and execute scenery and costumes, how to install and operate lighting equipment, how to design the lighting of a play, how to handle stage machinery and rig a stage; and he must be an organizer and a manager. In the larger theatres, where the production program is heavy and exacting, it is obvious that one man cannot be expected to perform all these duties.

12. *The Production Departments*

The production departments named above compose the organization which builds "the show." The whole organization is unified under the supervision of the technical director, but each department works under a responsible head. In some little theatres the technical director heads each department; in others a different individual supervises the work of each department in the execution of its work. In most instances these department heads and their assistants also compose the backstage organization for the "handling" as well as the "building of the show."

13. *The Backstage Organization*

After the "show is built," a backstage organization consisting of a stage-manager and crew will have to be organized and perfected in the "handling" of "the show" for final rehearsals and performances. In this organization the technical director himself may again "double" to serve as stage-manager. The stage-manager is in full charge of the stage during the performances. In many professional theatres he takes full charge of and has the responsibilities of the director for the show as soon as it opens. After the house manager notifies him that the audience is assembled, everything in the performance is under his orders until the last curtain has closed and the "show is put away." He gives the order for the overture to begin, for the "asbestos" to be raised, for the performance to start. Each time the curtain closes if the setting is to be changed, he gives the order to "strike," and not until he gives this order is the setting changed. He is responsible for the proper execution, on cue from the prompter, of all backstage effects, such as the ringing of bells and the firing of shots. Because of the importance of the prompter in the backstage organization, he is, as was previously noted, often assistant stage-manager. For the execution of his duties the stage-manager must select and train a stage crew. In addition to the assistant stage-manager, the stage crew will consist of a scenery foreman ("carpenter"), who is sometimes the assistant stage-manager, a flyman, several men who shift the scenery ("grips"), controlboard operator ("electrician") with one or more assistants, a property man and assistants, a wardrobe-mistress and assistants, and a prompter. If the production is heavy, it may require several assistants in each department. The whole procedure in the "handling of the show" must be carefully planned and the crew rehearsed until their work is perfectly coördinated, silent, and rapid. Toward this end the stage-manager will hold regular crew rehearsals.

In the very beginning of his work, then, as in all of his later undertakings, the director must be a capable organizer. Much of the success of his theatre and his productions will depend upon the perfection of the organization in its various units. Since much of the work of any theatre must be done hurriedly and under stress, which under the best conditions entails a considerable nervous strain, a properly coördinated and efficient organization will decidedly reduce, if not entirely eliminate, the unpleasantness that may arise in this work. Frequent conferences and discussions will be found very effective in building the proper morale in this organization. In many of the nonprofessional theatres where most of the work is done by volunteers without pay, the morale of the organization, the love of the work, and the enjoyment derived from it, are the chief incentives toward its continuance. In the direction of these people, diplomacy and wise management are essential.

CHAPTER II

SELECTING PLAYS

Except for necessary changes and replacements from time to time, the organization once perfected continues to function from year to year under the supervision of the director. His next task, however, that of selecting plays, must be performed with mature and deliberate judgment, season after season. The mere fact that the director or the committee happen to like a play is not sufficient reason for its production; it is not to be produced primarily for their own amusement. On the other hand, it is important that the plays selected meet with the director's approval. Into the choice of a play must go a knowledge of it, an understanding of the audience for which it is to be produced, an exact knowledge of the potentialities of the theatre in which it is to be produced, a clear insight into the capabilities of the staff and the potential cast which will produce and act it, ascertainment that the rights of production may be obtained and at not too exorbitant royalties, an assurance that the means of financing its production are available, and, finally, a full consideration of the relation of the play to the entire program for the season.

1. *The Season's Program*

Because of this last consideration and for other reasons many directors find it wise to select the program for the entire year before the opening of the season. This allows greater opportunity for a more coördinated as well as varied program than does the hand-to-mouth method of selection. In this way the offerings can be properly balanced so as not to overload the season with too many productions of a similar nature, but to provide a proper distribution of modern plays and revivals, costume plays and plays in modern dress, plays in the traditional style and technique, and the so-called experimental plays. Such methodical planning of the season's program obviates last minute hurry in selection, which often results in frantic grasping at anything in order to get the play into rehearsal. In organizations which use the season ticket sale, this system gives the business manager a much better opportunity for advertising and successfully conducting his sales. It provides him a basis for estimating the budget for the season and allotting expense accounts to the various departments. It is an aid to the technical director also in organizing and laying out the work of the production staff, as well as in designing the settings. To the director it offers opportunity for the careful and unhurried study of each play, and for the equitable distribution of rehearsal time.

2. *Variety in the Program*

In deciding upon the program of plays for the season the director and his committee should employ a wise eclecticism. All too frequently the nonprofessional theatre tends to fall into a rut in the choice of types of plays to be presented. Sometimes this is the result of ignorance on the part of the director of the all-embracing nature of drama, but more frequently it is the result of a narrow predilection on the part of those responsible for the choice for a single type and style of play. Thus, for one reason or another, too many organizations tend to favor, to the virtual exclusion of all else, the modern social problem play, or the ultra-modern expressionistic play, or the sentimental and romantic drama, or the folk-play. Such an overemphasis upon a single type or style wearies a general audience, and tends to restrict patronage of the organization to very narrow circles. The field of drama is so wide, so rich, and so old, that there is no need or excuse for this. The wise director is tireless and unceasing in his study of drama and in his search for both old and new plays worthy of presentation to his patrons. There are, of course, exceptions to this broad eclecticism in the planning of programs, especially in organizations whose sole purpose is the production of a special type of play or plays, or of plays of a single period, but even these restrictions are not necessarily incompatible with variety in choice. Average nonprofessional theatres, however, are less narrowly circumscribed, and the directors of these can add greatly to the chances for success and solve many of their problems of selection by a studious devotion to the drama, past and present. It does seem rather absurd that any intelligent director should frantically ask what he can produce or how he will cope with the royalty problem when good plays by the hundreds have been written since the fifth century before Christ. Such a hopeless questioning is rather an admission of ignorance and a lack of imagination and ingenuity, than a reflection upon modern playwrights and the prevailing royalty system.

3. *Royalties*

Perhaps a few remarks here upon the question of royalties may not be amiss. No self-respecting director will or can afford to make himself party to the dishonest stratagems and subterfuges all too frequently practiced by some nonprofessional theatres to escape the payment of royalties. A laborer is worthy of his hire, and such practices of depriving him of his just and due returns are no less than thievery. Under no circumstances does an intelligent director need to stoop to such dishonesty. With the whole range of dramatic literature to choose from, European and American, ancient and modern, the director must be ignorant indeed who cannot build season after season's program without an undue load of royalty payments. It is just as honest to steal the lumber, cloth, and paint that go into the making of the scenery as it is to steal the play produced.

The royalty charges on plays vary from five to fifty or more dollars for each performance. Some very recent plays which the producers expect to go well in stock are not available for little-theatre production. There is no apparent reason for these stock restrictions, the existence of which may be learned only from the agents or publishers of the play. Frequently stock restrictions are made to apply to communities which never had or will be likely to have a professional stock company; yet in these communities little theatres are not permitted to play these restricted plays. The director should ascertain if the play is available and at what royalty, when he considers its inclusion in his season of productions.

4. *The Budget*

The production must be paid for; therefore, one of the first considerations in planning a program for the season is the budget. Careful attention must be given to the cost of overhead expenses, royalties, scenery, costumes, properties, and equipment. An entire program of plays expensive to costume and set is apt to bankrupt any nonprofessional theatre which is largely dependent upon admission receipts for its income. The more spectacular and expensive productions should be carefully balanced with the less expensive. In the selection, careful attention should be given to the possible utilization of old costumes and scenery, which may be reworked or rebuilt. Care and ingenuity must be exercised in this, however, for an audience is as easily wearied with the same old set or dress used over and over, as it is with the constant repetition of the same type of play. Before a play is finally admitted to a place on the program, the business manager aided by the heads of the various production departments should make an exact estimate and draw up an accurate budget of the cost of its production.

5. *Audience Appeal*

But the cost of the production, be it small or great, signifies nothing if the play is lacking in appeal to the audience. How will it go over? This is the initial question staring every producer, professional or nonprofessional, in the face when he selects a play. And the answer, however astute the producer may be, remains unresolved until the production is before the audience. The appeal of a play to an audience varies from community to community and from season to season. It is dependent upon that subtle and fickle arbiter known as taste. The sensitive director will observe and utilize the taste of the community in the planning of his programs. Only at his peril will he persist in presenting plays that run counter to the likes and dislikes of his audiences. Every community has its prejudices, beliefs, or accepted dogmas, which the director there dares not disregard. Restrictions of this nature in some of the smaller institutions and communities are absurd and notorious. No director would last a day who dared violate them. And even in the larger institutions and more cosmopolitan centers there are groups, sects, and opinions, of which the director must be cognizant in choosing plays for production. Some sad and some amusing situations have resulted from producers violating the local *mores* and taboos. One of the amusing ones arose in a Western state university when a well-known religious sect protested a production of *Why Marry?*, by Jesse Lynch Williams; an even more amusing situation arose recently in a Southern community when a woman's patriotic organization attempted to prevent a production of *Uncle Tom's Cabin* by a group in a state-supported institution. In each of these instances the performances were given because the directors knew that the protesting groups lacked sufficient power to injure the organizations and their work seriously. Such situations must be met with tact and diplomacy.

Restrictions and dislikes of this nature are, however, usually rather obvious and easily met by the alert director. A much more difficult matter is the determining of what the audience does want. Here, indeed alertness and intelligence are required. A wide and intimate acquaintance with the community will help to solve the question. Attention to the programs of clubs, churches, and social groups, perusal of the local papers, information as to the kinds of books withdrawn from the local library—in short, a systematic study of the whole social activity of the community will yield many suggestions.

Such suggestions immediately raise the question: Should a director give the public what it wants or what it ought to have? In most discussions of this question it should rather be stated: Should the director give the public what it wants or what he thinks it ought to have? Without entering into the matter too fully, it may be stated dogmatically that in the beginning an organization should meet its audience upon its own ground. This, under no circumstances means that the director must be forced directly and continually into competition with the cheaper class of cinema productions. Every experienced director knows that with the power of the spoken word, and with all the avenues of propaganda open to him, he can gradually build the kind of audience taste and critical appreciation he desires, if he will but work patiently and wisely. It may happen in some few cases in the beginning of his work that the director will have to make some compromise with his own judgment in the choice of plays, but with proper attention to the education of the audience and with a taste broad enough to embrace all the many good types of dramatic entertainment, he should not have to compromise for long. In this power to educate audiences lies one of the great forces of the theatre for the good of society; and such a power it is that no community can afford to have in charge of its theatre a director of narrow or perverted outlook.

6. *Determinate Questions*

With these subtle and large considerations in the choice of a play go more open and determinate questions. First of these is: Can actors be secured capable of interpreting the rôles in the play selected? However much a director may desire to produce *Hamlet*, and however much his audience may long to see *Hamlet* produced, obviously it cannot be done without a Hamlet. But it would be just as foolish to attempt a production of *Hamlet* with a good Hamlet and not enough competent actors to fill the other rôles. Enough competent actors to fill all the rôles adequately is an all too obvious requisite consideration in the choice of a play; but there is a corollary consideration of almost equal importance, which is frequently overlooked by directors. Can the play be cast without utilizing actors in rôles similar to those which they have played and played *ad nauseam* before the same audience? A second question of equal importance concerns the adequacy of the stage, the producing staff, and the equipment in the mounting of the play. Ingenuity here will certainly work wonders, but no amount of ingenuity will suddenly expand the narrow walls of a small stage, or provide expensive sets and equipment without money.

To summarize, then, the director or committee in choosing a play for production must consider:

a. Its relation to the whole program of the season;
b. The availability and cost of producing the play;
c. The reception of the play by the audience;
d. The availability and competence of actors for the rôles;
e. The adequacy of the stage, staff, and equipment for producing the play.

7. *Aids in the Selection of Plays*

The most important aid to any director in selecting a play or a season's program is an intimate reading acquaintance with the vast body of dramatic literature, European and American, ancient and modern. A director, it may be repeated, with such an acquaintance need never ask in utter bewilderment what play he can find to produce, and need not be at the mercy of the royalty charges. Some of the most successful performances in little-theatre groups have been revivals of old successes of other days. The competent director will assiduously cultivate his reading knowledge of these, making notes from his reading of plays that he may use. To guide him in this reading and in the selection of a season's program are a number of bibliographies and play lists, some of which are included in the bibliography at the end of this volume. A more complete list may be found in Blanch M. Baker's *Dramatic Bibliography*. Kenneth Macgowan's *Footlights Across America* gives lists and records of plays produced by outstanding little-theatre groups in America which show not only the plays produced over many seasons, but also the popularity and success of a large number of them. Excellent suggestions are to be found in these lists for selecting a varied program.

Few directors, however, will want to compose their programs of old to the exclusion of new plays. The director must, therefore, "keep up with what is happening on Broadway," and with what other little theatres are producing. To this end he will read the theatrical magazines and newspaper reviews of new plays as well as the plays themselves. Unfortunately, many of the new plays which he would like to produce will demand exorbitant royalties, or be unavailable in his community because of the notorious stock restrictions. His answer to such restrictions should be the production of new and untried plays, upon which Broadway has no grasp. The alert director will be constantly on the look-out for new and unproduced plays. There are many young playwrights in America writing good plays, who welcome an opportunity to have them tried out in production by a competent little theatre. Several organizations, such as The Carolina Playmakers, the Yale Theatre, and the Pasadena Community Playhouse, have made themselves producing and not merely re-producing theatres, by their work in performing original plays and giving playwrights a chance. Nothing may reflect more credit upon or bring favorable notice more quickly to a little theatre than productions of new and untried plays. It was chiefly by doing this that the Provincetown Players wrote themselves into the history of American drama.

CHAPTER III

DESIGNING THE WHOLE PRODUCTION

WITH the play chosen, a period of intensive work begins for the director. This work may be divided into two mutually related parts for purposes of this discussion: the study and mastery of the play, and the designing of the whole production. There are many amateur and would-be directors, it is true, who believe that with the selection of the play all that they need to do is to select a cast and immediately rush the play into rehearsal, trusting to chance and any suggestions that may arise in rehearsal to explain and clarify all obscurities. They believe that all that is necessary is to put the actors upon the stage with scripts in their hands and start them walking through their parts at the same time they are trying to read lines from the text, knowing neither what they are doing nor what they are saying. Such a method, or rather lack of method, lends some justification to the statement oft repeated by certain caustic little-theatre critics, that ninety percent of the nonprofessional productions in America are not worth sitting through. Fortunately, the work of directors engaged in such slap-dash, helter-skelter practices is seldom heard of beyond the local environs; but, unfortunately, far too many of this type have gained footholds in academic institutions where they are hedged about by the usual immunity that protects academic incompetence in all fields of learning, and where they continue from year to year to draw salaries, and to pervert student conceptions of the real nature of production. The great director, professional or nonprofessional, knows that before he thinks of casting a play, to say nothing of putting it into rehearsal, he must master that play and design his interpretation just as completely as the conductor of an orchestra must master his score before he begins rehearsals with the orchestra.

1. *Designing the Interpretation Requires Time*

Before the director can know the nature of the interpretation which he is going to project in his production, he must know the play itself. In the mastery of the play, in order that he may clearly perceive how to interpret it, and in the designing of the various elements of the interpretation, he has usually two sources of information at his disposal: the text of the play, and the commentaries on the play and its previous productions. The proper preparation of a play before casting and producing it requires a considerable amount of time and effort. Stanislavsky reports that in the Moscow Art Theatre production of *Julius Cæsar,* he and his colleagues spent month upon month of study and investigation. Contrasted with that is the statement made by a certain Pacific Coast university director, who said that no intelligent director need spend more than ten days in the entire preparation of *Hamlet* for the stage; contrasted, too, is the eminence and success of Stanislavsky and the anonymity and failure of the American director. Some plays will require comparatively little study for their production; others, such as those of Shakespeare, will require a long period of preparation, especially if the director is not well acquainted with the Elizabethan theatre, drama, costume, and all that goes into the re-creation of that age upon the stage. All of this work, it is obvious, cannot be done if the play must be performed within four weeks after it is chosen; hence, the director must insist upon the selection of the season's program far enough in advance of the opening date to permit him ample time for study. Most directors, too, like most orchestra conductors, continue to add to the repertoire of plays which they have studied and designed and are ready to produce.

2. *The Study of the Play*

The methods by which directors master plays vary greatly, depending upon the inclinations and habits of work peculiar to the individual. Each director eventually works out his own method; therefore, in comment upon this, as upon the various methods employed in other phases of the art of directing, dogmatic statements are unwarranted. The ways of art are as various as the ways of life; it is the bigoted artist alone who will declare that his method is the only true procedure. The nature of the materials to be mastered in an Elizabethan play, for example, may vary somewhat from that in a modern play, but the general characteristics are similar.

Though no absolute method of procedure can be prescribed, some suggestions for the study of any play may be made. This study has been divided above into two mutually related parts: the study of the text, and the study of the commentaries. First, then, comes a careful mastery of the lines of the text, so as to grasp clearly the specific connotation and denotation of every word and every speech. In the case of foreign plays, plays of the past, or modern plays presenting characters drawn from isolated and strange environments, this textual study must be pursued with special care. With this accomplished, the director should proceed to an analysis of the structure of the play. In order better to understand this, he should clearly formulate the theme or unifying idea, determine the crisis of the play, and analyze the method by which the playwright has developed his involving action up to the crisis. In the same way he should examine the resolving action and the method of bringing the work to an æsthetically satisfying conclusion. In this procedure the nature of the dramatic conflict will become clear, and the alignment of the characters involved in this conflict will be apparent. Next, he will proceed to a careful examination of the act and scene structure of the play to determine what each is supposed to accomplish and how it is related to its immediately adjacent scenes and acts. Most modern plays are not divided into scenes, but in this study of structure it is wise to divide them so. Using scenes according to the playwright's meaning of the term, that is, in the sense that every entrance and exit of a character denotes the end or beginning of a new scene (a group of characters entering at the same time constitutes a single entrance), he determines exactly what each accomplishes in the development of the situation, what each depends upon to arouse or maintain interest, just what the climax or high point of interest is in each, and how each is linked with and builds into the next. Beginning with the opening scene, he determines exactly how it is designed to seize the interest of the audience. At what point in the first act does the first overt action occur; that is, just where does the actual introduction of the involving action take place? How is it introduced, and how is it made to appear natural? The director examines carefully the methods of exposition employed by the author, the methods by which he reveals to the audience all that it must know of what has happened prior to the opening of the play in order intelligently to follow the story. By what means has he maintained the interest of the audience while he is narrating these necessary facts? To what extent has he employed suspense and surprise? How has he maintained his suspense and how has he sprung his surprises? In examining the building of the action from scene to scene and from act to act, any subtle uses of tempo employed for dramatic purposes in scene or act are carefully noted. Careful note should be made, too, of any dialogue introduced for the purpose of preparing for or motivating actions to occur later in the play.

3. *The Characters*

Such a study of the situation and structure of the play will have already led the director into some understanding of the characters, but these, too, should be submitted to rigorous examination. Beginning with the external characteristics, size, age, features, dress, social position, idiosyncrasies and mannerisms, and the relations of the characters to each other, should be carefully noted. Proceeding with the inner nature of each character, his heredity, environment, training, and past life should be determined, in so far as they are revealed and are important. More important, the emotions and passions, the ideas and beliefs that actuate the conduct of each character should be studied. The exact nature and place of the character in the action should be determined. With these characteristics of each personality in mind, attention should then be given to the methods by which the dramatist has revealed them in dialogue and action. Not until some such analysis as this has been made of the characters in the play is the director ready to cast the rôles.

4. *The Dialogue*

The study of the characters of a play involves a study of their dialogue. In this study it will become apparent why in the well written play the speeches of any character are peculiarly his own, and could not be assigned to anyone else. If the play or any character in it employs dialect, it will be necessary, as indicated before, to understand the general nature of the dialect. The peculiar combination of words and phrases which the author has subtly employed to produce a determined effect or put over an idea must be examined and made to yield its secret. The careful author writes his dialogue so that it will most effectively carry the burden of emotion or the suggestion of humor behind the speech. This careful coloring and shading of the dialogue is more often implicit than explicit. Only a sensitiveness acquired by sympathetic study will direct the voice to give it full value. Prose dialogue, as well as dialogue in poetic form, has its hidden beauties and delicacies awaiting the magnetic power of the human voice to call them forth to delight and thrill audiences. It is these more subtle and delicate elements in drama that the slap-dash director fails to perceive and give to his audiences. In addition to its beauties, every important piece of dialogue in a play has a contribution to make to the architecture of the whole. The director must know the point of every speech; he must know, too, why the dramatist thought that point could be most effectively made in the exact combination of words which he used.

5. *The Setting*

Into this preparation of the play must go a careful study of the whole setting—scenery, properties, costumes, and lighting. In modern plays this may not require the large amount of investigation entailed in plays of former periods, but in any play, study sufficient to yield a clear and exact idea of every element in the setting is requisite. Beginning with the specific set for each act, a ground-plan indicating all doors, windows, fireplaces, stairways, or other features of the indoor or outdoor scene of the action, should be carefully drawn to scale (see Part Two, Chap. VI). The next step is an examination to determine what furnishings or properties are necessary for the action of the play or for the adornment of the set. Both these and the sets may require, in addition to the information contained in the copy of the play, search for further information in commentaries, in works upon interiors or landscapes, and works on furniture. Especially are these works necessary in the designing of the settings, when each of its elements must eventually be described or pictured for the guidance of those who are to execute them. With the parts of the setting clearly in mind, the director proceeds to visualize the exact room or place as described by the author in which the action of each act occurs. This procedure is necessary for the visualization and imaginary projection of the action of the play. Equally necessary in this kinetic imagination of the action is the clear perception of the time of the action, not only the period in which the play occurs but also the relation of the time of one act to the other, and the precise time of day or night at which each occurs. This element of time will greatly influence the design of the lighting. Moreover, the nature of the costumes, which may also require considerable investigation in sources other than the play itself, is determined in part by the place and time of the action. In the study of the characters some idea of their costumes has already been attained, for costume is not only part of the environment of the play but is also an element in the revelation and projection of the characters.

6. *The Mood and Atmosphere*

Though more elusive and difficult to define, the mood and atmosphere of a play must be taken into consideration along with the other elements in this study. In evoking the varying series of harmonious emotional effects which a play attempts to accomplish, these are indispensable factors. Some plays, such as those of Maeterlinck, are largely dependent for their effectiveness upon the proper creation of mood and atmosphere. They play a conspicuous part, too, in such expressionistic plays as *The Adding Machine*. Other plays, such as some of the modern thesis plays, are not so largely dependent upon these, but it may be safely said that every play to some extent relies on them. Ibsen's *Ghosts* would lose much of its effectiveness if produced without any effort to capture the gloomy, sunless atmosphere of that Norwegian country and the mood of impending fate overhanging the lives of the Alving family. Shakespeare, who had no modern production methods to aid him, etched with subtle words the atmosphere and mood of the first scene in *Hamlet*. Shakespeare the word painter, like every other experienced playwright, understood the value of these and utilized them to the fullest in all of his major plays. The director in interpreting these plays for the public should let their mood and atmosphere infuse every element of the production. Those who have seen any of Reinhardt's productions know how expressively this can be done. It is not meant to imply in what has been said here, however, that the mood of a play is one continuing, unvarying tone. Like the emotions in the play, and the emotions evoked by the play, the mood may subtly vary from scene to scene and even within the scene, but all these variant moods are combined and woven into an harmonious tone. It is these, mood and atmosphere, that supply the keynote of the design of the *inscenierung*.

7. *Unity of the Whole Play*

The elements here indicated for study and the procedure, it should be repeated, are suggestive and not exhaustive. A play is such a complex and intricate form of art, and plays are so different one from another, that it cannot be hoped in a few pages of directions to cover all the elements that should be considered by the director. In his study of the details, however, the director must not lose sight of the whole play. He is to stage a complete and unified work, not a series of details. It is the whole effect, the totality of a series of effects, that he must see in his study and in designing his production.

8. *The Use of Commentaries*

In all of this study and in the designing of the whole production the director will often find it necessary, as has been indicated, in clarifying his work and in garnering ideas of value for his interpretation to have recourse to comments and discussions of the play and its former productions, as well as to many other sources of information, such as books on furniture, costume, period architecture, theatres of the past, production methods in former ages, and various kinds of works dealing with phases of life treated in modern plays. Although recent plays have not the wealth of critical material that elucidates old plays, many suggestions and ideas may be gathered from reviews and comments on the *première* and succeeding productions, and from published pictures. Both those recently produced and original unproduced plays may be vivified, elucidated, and illustrated with the aid of novels, stories, and articles depicting or dealing with a similar environment or similar characters. Even remote places and strange peoples—China, India, Russia, Central Europeans, German peasants, American Indians, Southern mountaineers, Louisiana Creoles—may be rendered more real and understandable for director and actor by the use of such references, which a little ingenuity and patient effort in any library will place in abundance at their disposal. When the director is engaged in the delightful task of studying and revivifying a play from the past, he may surround himself with a vast mass of helpful material. Shakespearean and Elizabethan plays in particular have thousands of volumes of commentaries and discussions devoted to them. In the study of these and other old plays there are bibliographies which will inform the director what is available and where it is to be found. Textual studies, histories of former productions, discussions of the interpretations of characters and the meaning of the play, biographies of actors who have played the rôles, biographies of the dramatist and evaluations of his work, are all or many of them available in the local library. This is by no means to say that such references should bind the director to a slavish copying of what has been done. They are to be used merely as aids in the understanding of the play, as storehouses from which to extract the crude material of artistic creation, and as a stimulus to the imagination. They are so used by every great director.

9. *Cutting the Play*

Not until he has made some such exhaustive study will any serious and intelligent director have the temerity to cut a play. He knows that in any good play the artist who wrote it has poured countless hours, days, and months of mature and deliberate effort. He knows that the work has been built stone by stone, and that the injudicious removal of any single stone may twist awry the architecture of the whole. All this patient workmanship has orchestrated scene by scene the whole play toward a definite and predetermined effect; and it is largely through the cumulation of the various themes and motifs, seemingly diversified and unrelated as they may be, that the final powerful and moving effect of the whole piece is produced. Realizing this, he knows that he cannot cut out a single speech, to say nothing of whole episodes and scenes, without the most mature deliberation. But every new production of a worthy play is a new artistic creation. As such it, too, has its center of unity, its definite and predetermined effect. Only after he has decided exactly what this effect that he wishes to produce in the new creation is to be will the artist-director begin to carve upon the marble of the original composition. When a director begins cutting a play, he becomes in a certain sense an author of and responsible for the new product. He must bring to his task, therefore, the same type of knowledge of structure and craftsmanship as that possessed by the dramatist himself. It is no wonder then that he proceeds with caution and care. Yet probably no play that was ever written went into its first production without some cutting and modification. New plays brought out by the professional theatre are often almost entirely rewritten in rehearsal and even after the opening performance. But here, in practically all instances, the author is present to do the revising. In the nonprofessional theatre the more usual reason for cutting a play is to fit it to the abilities of the organization to cast and mount. When changes of any radical nature are made for this reason or others by anyone except the author, it is only fair to him to include on the printed program a statement that such changes have been made. This statement is not to the same degree necessary in the case of a play of an earlier period. Everyone is cognizant of the fact that Shakespeare's plays were written for a stage radically different from that of today, and that they must undergo modification for modern presentation. In this undertaking the director has long precedent behind him for cutting and "improving" Shakespeare. From the cut versions of former productions he can learn much about what not to do in preparing a Shakespeare play for his own use.

10. *Designing the Production: Dominant Effect*

But a proper cutting of a play cannot be made until the director knows the nature of the interpretation which he intends to give it. In the study of the play outlined thus far the primary purpose throughout has been to understand exactly what the author meant in his work, and how he set about putting over that meaning, that predetermined effect. Having satisfied himself on these important points, the question before the director now is what means, what method, manner, or style of production will be best and most effective in interpreting this work of art. The director may have chosen the play in the first place because he had an interesting and novel idea for its interpretation—*Hamlet* in modern dress. Usually, however, the idea of the interpretation grows with the study of the play.

The complete setting—scenery, lighting, costumes, properties—along with the action and business of the play, and the interpretation of the rôles, must be thought of and designed as a complete whole, unified by and projecting the dominant effect aimed at in the interpretation of the play by means of production on the stage. The English language has no single word expressive of this unified and harmonious whole composed of all the elements of production, but writers and theatre people have taken over a word from the Germans, *inscenierung*, to denote this conception. It is this *inscenierung* which the director must conceive. The actual process of designing in complete detail and constructing the various elements of the *inscenierung* is a technical matter requiring specific training in stage design and knowledge and experience in craftsmanship and stage engineering. Design and construction of scenery will be discussed in detail in Part Two of this work, and the design and executing of the lighting in similar detail in Part Three.

11. *Style and Manner in Production*

A play may be variously interpreted. Indeed, this is true to a greater extent of it than of other forms of art, with perhaps the exception of a musical composition, because every new production of a play with new combinations in the *inscenierung* exhibiting a new design, is essentially a new creation. For example, *A Doll's House* may be interpreted in the costumes and settings of the Eighteen-eighties or in modern dress. It may be played up strongly as a thesis play on woman's rights, or it may be turned into a good old melodrama with a happy ending, as it was when first produced. It may be considered as Nora's play, in which case Torvald becomes an antipathetic figure—a big, obtuse, sentimental, egotistic, kindly oppressive, peremptory, Rotarian husband. On the other hand, the director may decide that Nora is after all the incarnation of modern feminine selfishness, who certainly wants to eat her cake and have it too, who demands in the end nothing less than the world with a fence around it. He may go even further than this in his interpretation. He may not see the play as realistic at all, that is, as the entanglement in real, everyday living of actual human beings; he may visualize Torvald and Nora as mere puppets in the hands of heredity and environment, and read into the play some large symbolic meaning. Perhaps he sees this heredity most powerfully and symbolically portrayed in Dr. Rank, just as he may see environment portrayed in Krogstad. These two may become great stalking, menacing figures subtly manipulating the destinies of those helpless puppet-people. With such a conception the production designed to project it would hardly be the realistic representation to which we are accustomed. It would tend more toward the stylized and expressionistic than toward the realistic. The objection to such an interpretation in this instance is that it would probably do violence to the whole meaning of the play. The final effect probably would be ununified and decidedly puzzling. This play is too closely bound down to its thesis and to its realistic characters, dialogue, and setting to permit this free and imaginative interpretation. Ibsen's symbolic plays, such as *The Wild Duck*, *The Lady From the Sea*, *Rosmersholm*, and *When We Dead Awaken*, and especially his two romantic plays in verse, *Brand* and *Peer Gynt*, offer much greater opportunities for a free, untrammeled, and poetic interpretation than do the realistic social problem plays. Shakespeare's romantic and poetic plays offer even greater opportunities. The theatre has had many interpretations of *Hamlet;* yet, some few years ago Gordon Craig revealed greater beauty and more imaginative possibilities in the interpretation on the stage of this outstanding masterpiece of drama. *Hamlet* may be played, and some scholars think the Elizabethans played it, as a good ranting melodrama. Coleridge, Goethe, and the romantic critics, on the other hand, greatly emphasized the intellectual and thoughtful elements in the play, and the vacillating element in Hamlet's character. Today some have gone even further in psychologizing Hamlet. Perhaps Shakespeare did mean to write a modern psychological drama, but it is greatly to be doubted. Nevertheless, a modern director has a perfect right so to interpret the play if he chooses. He may play it in modern costume and slur the nature of the verse dialogue. He may play it in the Elizabethan manner, or he may go in for a revival of the Garrick manner of playing it (God forbid!). The manner or style of production which he adopts will depend upon the conception he wishes to put over and the effect he wishes to create. Once having made his adoption, the play must be staged throughout in a unified manner. He cannot design one scene in the realistic manner and another in the expressionistic. He cannot ordinarily permit one character to be played with extreme realistic fidelity, another to be played as a type, and others to be played with exaggerated expressionistic effect. The dominant motif must infuse the whole production. Acting, settings, properties, costumes, lights, music must all be in harmony. The only way to attain this harmony is to keep clearly in mind in the designing and executing of the parts the dominant effect to be created. The designing of a production, therefore, must be an orderly process.

12. *Designing the Setting*

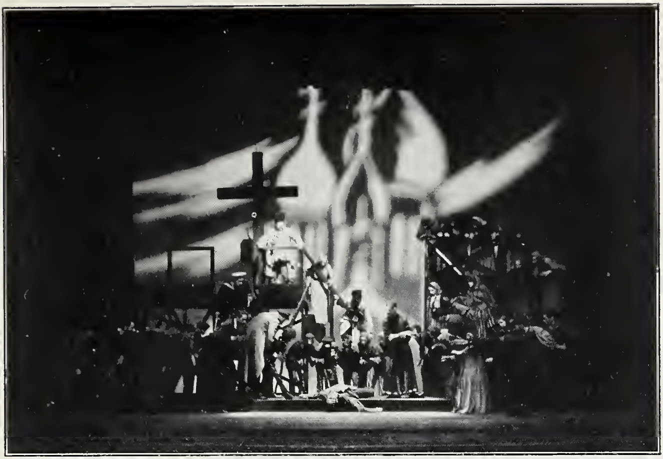
The designing of the elements that go into the mounting of a play—settings, properties, lighting, and costumes—is often left until after the play is cast. Moreover, in the majority of little theatres this is done by the technical staff—the technical director and the heads of departments; but since the motif and style of production is determined by the director, and since he must have in mind a general idea of the mounting of the play in order to complete his design for the whole production, it will not be out of place to include some discussion of these elements here. Sometimes in the smaller organizations the practical designing of all these elements devolves upon the director. The ideal director would know how to design the whole show. But the design and execution of all the elements in a season's program is too heavy a burden for the director to undertake along with all his other duties in the limited time usually allotted to productions; consequently, the director early provides his staff with copies of the play in order that they, too, may study it. Before the final designs are made, a clear understanding and unified idea of the production should be conveyed to the whole production staff by means of conferences and discussions. In many instances the whole design is a coöperative affair developed by the director and his staff in these conferences and discussions.

13. *Theory of Stage Setting*

The whole setting for the production should be designed with due regard for its relative importance in the *inscenierung*. Considerable controversy and discussion have been devoted to the question of the place and importance of the setting. Producers and directors, such as Copeau, reacting against the over-elaboration of settings and stage effects, have had recourse to a formalized unit stage, built with various levels, to be used without scenery, set by means of controlled lighting only. Certainly it is true that many nonprofessional and professional productions have unduly emphasized the settings and stage effects at the expense of the play. A setting or a big effect has been made to stand out for its own sake, has become a mere theatrical trick. There are dramatic performances, such as musical comedies and burlesque shows, in which such trickery may have a perfectly legitimate place, but its inclusion in the performances of regular drama is seriously to be questioned. It can be stated almost as axiomatic, that when any part of the setting calls attention to itself for its own sake, it is bad. The setting is merely the environment in which the action of the drama is framed. It is so obvious that it is frequently overlooked that the play is the most important, the paramount thing. The setting is an element in its interpretation, important, but subordinate to that other element—the actors. It is a background from which the actor projects his interpretation. But it, too, is an interpretation of, an actor in, that same play which the cast is rendering, and as such it must be made to act with him.

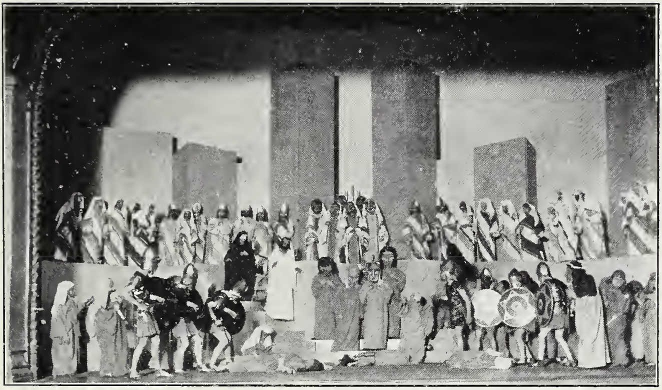
14. *Qualities of the Setting: Interest*

In order that it may accomplish its purpose, the whole setting must be made interesting, harmonious, and expressive. Because it is only one element in a whole does not mean that it is to be condemned to an utterly colorless existence, that it is something inert and dead, without meaning or beauty. Nothing is more wearying to an audience than to have to look at a flat, drab setting throughout an evening. Every element of the setting should be made as interesting and as effective as is possible, but such an ideal allows no place for blatant display. Pretty clothes are desirable in some plays, but because of that the wardrobe-mistress does not have license to make a style show of a play. Heads of departments in their interest and enthusiasm sometimes lose perspective in de-



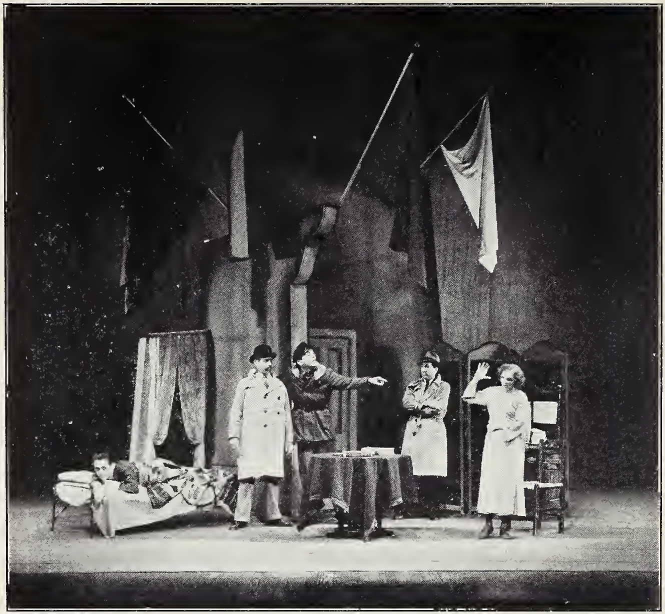
A scene from *The Armoured Train* by V. Ivanov, as produced at the Pasadena Community Playhouse, Gilmor Brown, Producing Director. Charles Levinson directed this first American presentation of this play. The settings by Janis Muncis.

Note the employment of levels and the arrangement of the grouping.



A scene from the première production of O'Neill's *Lazarus Laughed,* produced by the Pasadena Community Playhouse, Gilmor Brown, Producing Director.

Note the use of levels, masks, and conventionalized grouping.



Vandamm

A study in effective pantomime. A scene from Clifford Odets's *Till the Day I Die,* staged for the Group Theatre by Cheryl Crawford.

signing their parts of the production, but the director must maintain the proper coördination.

15. *Harmony*

In striving for interest in the setting, therefore, the harmony of the whole must not be lost sight of. The dominant unified effect aimed at in the whole production must control and mold the designs of the setting, so that it becomes one of the actors in creating this effect upon the audience. But the effect created by the setting must not clash with the effect aimed at by the actors. Furthermore, the setting must not be out of keeping with the time, place, and characters of the play. A Queen Anne chair must not be placed in the Queen's closet in *Hamlet*. The lack of harmony that would result from playing Strindberg's *The Father* in such a setting as that described for the first act of Philip Barry's *You and I* would so falsify the mood and atmosphere of that play that the production would be puzzling in the extreme. Such anachronisms are easily recognized and avoided, but the harmonization of all the elements of production requires thought and study.

16. *Expressiveness*

Such a harmonization of the elements in the setting will go far toward giving them that necessary expressiveness which they must have to fulfill their function. Indeed a large part of the expressiveness of the setting depends upon the harmonious relationship of its parts to the manner and style of the production and to the unified effect aimed at. The mood and atmosphere of each scene and of the whole play can be strikingly revealed by these, especially by the scenery and lighting. Settings can and should be made to reveal the time and place of the action; but more than that, they can be made to reveal and express the characters. Houses and rooms look like the people who live in them—at least they do on the stage. They disclose the nature, taste, and social level of their occupants either directly or by contrast. Furniture and draperies, books and bric-a-brac, all articles of ornament and adornment—called the properties—can likewise, when chosen with taste and intelligence, become a subtle and effective means of expressing character. Those things which people live with for long reveal the personalities of those people, for they seem to take on something of the very coloring of the owners' personalities. Everyone has seen at one time or another a room in which a single thing, a picture, a vase, a lamp, a chair, or a combination of these, established the whole tone and character of the entire room, and marked it as eminently belonging to the occupant. It was not only the thing itself that did it, it was the peculiar way in which it was fitted into the room. It is such an effect that the director should aim to accomplish with every property he uses.

17. *Selecting the Properties*

Perhaps the script calls for a table. What kind of a table? Not just any table will do, for this table must accomplish more than to serve as a repository for articles or a stand for a lamp. A chair by the fireplace is called for. Is it a new and shiny Grand Rapids chair, or is it an old worn rocker with the scars of long use upon it, in which Grandpa has sat night after night and smoked his pipe these forty years? Perhaps it is a neat, prim, uncomfortable, straight-back, spindly Queen Anne chair, that looks like the prim, little, thin old maid who sits so straight and uncompromising in it. Character is thereby expressed by the choice, for people like and choose the objects they use and have about them because of what they are. On the other hand, what they are may be revealed in their reaction to or dislike of that with which they are forced to live, as it is in *Fixins,* by Paul and Erma Green. In any event, there is opportunity for the sensitive director.

18. *The Property List*

From the director's point of view, properties may be divided into two classes: the minimum essentials for the enactment of the play, which are called for in the script, and the additional articles provided for the more complete and effective realization of the environment of the action. They include, therefore, not only the actual furniture, but also the pictures, draperies, books, bric-a-brac, food, flowers, and any other articles of ornament and adornment, or of utility in the action. They include all articles handled by actors in the enactment of their rôles, such as letters, bags, canes, purses, money, umbrellas; but they do not include articles of clothing worn by an actor. If, however, an article of clothing not worn by an actor is carried on or handled on the stage in executing a piece of business, such as the stockings which Nora shows to Dr. Rank in *A Doll's House*, that article is considered a "prop," and must be provided by the property man. The property list is made up by noting from the script of the play the essential articles required for the action and adding to these the articles included in the design of the setting for purposes of effectiveness only. In making up the property list, the articles should be classified according to properties and hand properties. Hand properties include all articles carried on the stage by an actor. Every article on the list should be exactly described, and if necessary, the description should include measurements and sketches. Either the director or technical director, or both, prepare this list and pass it on to the property man as soon as work on the production begins.

19. *Arranging the Properties*

As has been said, the arrangement as well as the selection of the properties aids in the expression of idea, mood, atmosphere, and character. The disordered, cluttered, tenant farmer's dirty living-room, with clothing hanging about on nails in the walls, no curtains at the windows, a rag stuffed in a broken windowpane, the mantelpiece littered with all kinds of trash, speaks eloquently of the people who live there. But the placing of furniture on the stage requires several considerations. Because of its purpose it differs from the arrangement of furniture in an actual room. It is, in the first place, viewed from a different point of view. Framed within a modern proscenium, it must furnish a picture for the audience. As a stage picture it must obey certain laws of design, the most obvious of which are proportion and balance. The pieces of furniture must be so distributed that they do not appear crowded, but form a pleasing arrangement. In size, they must be proportionate to the space which they occupy. A few spindly properties in a large massive room would be ludicrous. Perhaps the chief consideration in arrangement, from the standpoint of the design, is balance, a proportionate distribution of the furniture so that one piece weighs equivalently against another. If, for example, too many massive pieces are placed upon the right side of the stage without an accompanying balance on the left, the balance may be so effectively destroyed as to give the stage the appearance of tilting up on the left and down on the right. The two sides of the stage do not weigh equally against each other. A large tapestry on the left wall might, however, serve to balance a fireplace or large piece of furniture on the opposite side. That is, the maintenance of balance does not mean that an exact, rigid duplication, or parallelism must obtain. Such an arrangement would be uninteresting and tiring. The study of works on interior decorating will furnish many valuable suggestions in the arrangement of properties on the stage.

20. *Acting Areas*

Because of its purpose, several other considerations must be mentioned in the placing of furniture on the stage. The old nineteenth century manner of setting all the furniture across the stage so that it faces the footlights rigidly and unnaturally is such a violent distortion of illusion in a modern play that it would seem obvious to everyone. Yet the frequency of its occurrence today shows that it is not. It is true that the first law of the stage is that the actors must be seen and heard, but in arranging the furniture obedience to this law does not necessitate the violation of the illusion of an actual room. Ingenuity and study will easily remedy an unnatural arrangement. The stage must not appear crowded (unless, of course, that is the aim), nor must it appear to be sparingly furnished. Large bare spaces must not appear; but sufficient space for the actors must be left clear so that they may perform with perfect ease. In placing the furniture, the business that has been planned must be kept in mind. If this is not done and modern area lighting is employed rather than a flat general illumination of the stage, some of the action is apt to occur around furniture in a comparatively unilluminated area. As an aid in avoiding this hazard the stage may be conventionally divided into six acting areas: down stage center, down stage right and left, and up stage center, right, and left. The most emphatic of these is stage center. A setting—scenery, properties, and lighting—may be planned (according to the stage directions, or the director's design) to include the whole stage with all its acting areas—a full-stage set; or it may utilize several, or only one of these. The design of either of these settings is determined by the interpretation of the play and the demands of the action.

21. *Costume and Make-up*

A word may be included here upon the subject of costume, although that part of the setting can not be discussed in full and complete detail within the scope of this work. A costume should be designed first, as an aid to the actor in portraying his rôle, and secondly, as an harmonious element in the *inscenierung*. The first requires that it be in keeping with the individuality and personality of the character it expresses, and that it be in the style of the period and nation in which the character lives. The second requires that it be designed in accordance with the period and nation in which the scene is set, and that consideration be given to line, color, and materials. The proper design and execution of costumes in the revival of old plays demand a study of period costume. There are a great number of books on the history of costume, period costumes, the costumes of different nationalities, and on the procedure to be followed in making and dying costumes, that will aid the director and the wardrobe-mistress. Intimately associated with his costume is the actor's make-up. These should be designed together by the same person, or at least in harmony with each other as well as with the character who wears them and the style and manner of the production. Both must be executed with a knowledge of the lighting of the scene in which they appear (see Part Three, Chap. IV).

22. *Designing the Business*

Having worked out the setting, the director is now ready to design the stage business. In his study thus far he has gained a fairly complete conception of the action of the play if he has read and studied the play properly. Plays should not be read as are essays or even novels. They should be read with a kinetic imagination that sees in the mind's eye the whole action from the opening to the close. In this type of study the director imagines in all its details the exact room in which the Helmers (*A Doll's House*) live. He sees each door, the wall paper, all the furnishings, the windows and draperies, the carpet and rugs, every little detail. Beginning with the opening, he sees Nora enter, glance about the room, go to the table, put down her bundles and her muff, and remove her gloves. He sees her exactly as she is, her costume, her appearance, her walk, her voice. Aided by the author's stage directions first of all, and by his intimate knowledge of the characters of the whole play, he follows Nora and every other character through their every movement—entrance, exit, cross, sitting, rising, shaking hands, bowing, and to some extent every gesture—from their first appearance, through each scene and act, to the close. Some authors are very generous with directions, making the visualization of the action fairly easy; other authors include few directions. Acting versions of older plays are often to be had, and some publishers issue acting versions of modern plays with very copious directions. It is doubtful if any director ever found in them exactly suitable directions, which could be retained throughout. Since the action and business must be in harmony with the dominant idea of the production, and must contribute to the totality of the effect aimed at, and since every new production of a play is a new creation, the director may or may not incorporate the author's directions in designing the business for his production. They furnish an excellent beginning for the visualization of the action, but their retention depends upon their harmony with the design of the whole. Accepting gratefully any suggestions given by the author or found in acting versions, the director proceeds to "business" his own production. With the floor-plan of each set before him, he charts and plots every piece of business with care. After the most painstaking effort employed in this, there will be certain parts of the action which will have to be changed when the actors are on the stage going through it. A more complete discussion of this subject, therefore, is reserved for the section on business rehearsals (see Chapter V).

23. *Preparing the Prompt Book*

The results of this study are summarized and recorded in a Director's Copy or Prompt Book of the play. This when finished will form a complete and accurate acting version of the play and a detailed analysis of the production. There is no single system or method of preparing this copy, no set style or unvarying content to be included. The method and content varies from director to director and from play to play.

The first step is the preparation of the book itself. If the script of the play is typed on regular letter size paper (8½ x 11), the actual making of the book may consist merely of the mounting of the floor-plans, drawings, and pictures, the typing of the various lists on sheets of similar size, the perforation of these sheets, and the insertion of them into a loose-leaf binder. If the text is printed, two of the printed copies will be necessary to make a prompt book. Carefully unbind each of the printed copies and mount them on sheets of paper not smaller than 8½ x 11. These sheets should be of good grade, heavy, and durable. Beginning with the title-page, mount each leaf of the printed copy. When page one of the first printed copy is pasted face up on the sheet of paper, page two, printed on the reverse side, is entirely hidden. The operation is repeated with the first leaf of the second printed copy, with page two showing. In this manner both copies of the printed text are used to make a single prompt book. Floor-plans are drawn, pictures mounted, and lists are typed on sheets of the same size. When the mounted sheets are thoroughly dry, they, with the drawings, pictures, and lists, are perforated for inclusion in a loose-leaf binder. The binding holes will need reinforcing. The book should not be permanently bound, at least not until after the performances.

The book so prepared is ready to receive the director's notes of interpretation. The prompt book will include, in addition to the text, all the business, floor-plans of all the settings, complete property lists, light plots, designs of the sets and costumes (often included after the performances in order to make the book a complete record), and any other records pertaining to the production, such as rehearsal schedules, which the director may desire to include. On the margins of the text the director writes the business. Beginning with the first line, or the rise of the curtain, he indicates every entrance or exit, every cross or movement, every effect used in interpreting the play. Some of this will be indicated in the printed directions, which are retained; while the directions not used are crossed out. He will write all this in the copy in pencil, *not in ink,* for he is aware that often much of it will have to be modified, the directions erased and rewritten. Frequently, especially with the entrances and exits of important characters in big scenes, he will draw in the margin on the blank paper opposite the scene a miniature floor-plan of the scene, upon which he can indicate important groupings. Into the book he will insert notes on interpretations of lines, indications of words to be stressed or pointed, and indications of the tempo. These interpretative directions and signs some directors prefer to write in blue, using a black pencil for business on stage. Off-stage effects and directions are differentiated by being written in red. Such off-stage matters will be indicated with warnings for their execution. Thus into the book will go in red the directions for "curtain," "fast curtain," "black out," "bell rings," "a baby cries"; and opposite the stage direction, "he turns on the lights," will appear in red "lights up. . . ." Two minutes before any of these occur a warning will have been given to the proper persons by the prompter through an assistant. Thus at the proper place in the text (approximately two minutes before the end) will occur in red "warn curtain," and before the entrance of Nora will occur "call Nora." In this way the prompt book is made a guide for the performances as well as a record by which the rehearsals are conducted.

In order to save space and time the director and prompter employ a number of abbreviations in writing the directions into the book. Some of the old stage direction symbols so common in nineteenth century texts, such as R.E. for right entrance, L.E. for left entrance, R.U.E. and L.U.E. for right and left upper entrance, and L.F.E. for left first entrance are not generally used today. Other symbols and abbreviations, such as "Xing" for crossing or "John Ex. D.L.," for "John exits down left," are employed, varying from director to director. Those used are a matter of choice, so long as they convey a clear accurate record of the interpretation upon the stage of the printed text. In the same way, the use of colored pencils is entirely optional. They are a convenience, not a necessity. In the majority of modern plays, unless otherwise stated, right and left are used in the stage directions to mean stage right and left, from the actor's point of view. In entering directions for business into the prompt book, and in all stage usage, these terms should be used in this same sense.

After the performances, the prompt book may be retained for a permanent record of the production to be brought forth and used again in case the play is revived. For this purpose many directors like to make the record as complete as possible. Exact descriptions and designs along with photographs of the sets, costumes, properties, and make-up are included. Some directors like to include records of the run of the play, financial accounts, and criticisms, in this permanent record. In this way, the director and the organization can build up year by year a repertoire, in which revivals are made comparatively easy.

CHAPTER IV

SELECTING THE CAST

Having mastered the play and determined the interpretation which he will give it, especially with regard to the characters, the director is ready to select a cast. It is often said that the choice of a good cast is half the battle won. Whether it be a half or a third, it is a highly important matter, upon which time and thought well spent will pay dividends in the rehearsals and performances. By what methods may casts be selected for plays? There are several methods, each of them good in its way. A director may select the cast himself, or he may rely upon the assistance of a committee. He may cast the play merely by choosing actors with whose work and abilities he is familiar through former performances; he may cast the play by means of interview; he may cast it by means of tryouts; or he may use a combination of these methods.

1. *Casting Plays with Actors from Former Productions*

Every director who has worked in a community or institution for any length of time utilizes the knowledge he has gained of available actors who have demonstrated their abilities in former productions to cast his new productions. Even while he is studying the play he often thinks of certain rôles as specifically suited to certain of his actors, and designs the interpretations of the characters with these actors in mind. From the standpoint of efficiency this is probably the best method of casting, but used exclusively in little theatres meant to serve many people and dependent upon popular patronage, it gives no place to new actors and is likely to result in the charge of favoritism. When it is used, it should be in combination with other methods.

For his major productions the director may use this method exclusively if he provides other means for the selection of new actors. Some directors accomplish this by building up a corps of available actors through interviews and through public tryouts held at stated intervals. The aspiring actors selected in these ways are used as rapidly as possible in minor rôles and as understudies until they have demonstrated their abilities, at which time they are given important rôles in the major productions. An even better scheme is to run a series of studio productions designed to give new actors an opportunity to demonstrate their abilities and to receive training which may fit them to play in the major public productions. These studio productions are open to any new actor. They may be cast either by interview or by tryouts. This scheme of supplementary productions requires a staff of assistant directors to whom, as well as to the actors, it gives training.

2. *The Interview Method*

In some professional productions and in some community theatres where the method of open and public tryouts would be impracticable, the director employs a system of appointment to rôles based upon information obtained through interviews with prospective actors. The interview may or may not be supplemented by an individual tryout or reading designed to show the actor's abilities. In such an interview the director seeks first of all to "size up" the actor—to note his appearance, his voice, his manner, his type; and secondly, to discover what experience and training he has had. This information the director enters upon a record with the name, address, telephone number, and any other useful information, such as when the actor is available. Some directors request a photograph to be included with this record. Such records should be added to from time to time as the actors play new rôles, and the information concerning them, such as the address, should be kept up to date. Whether the casting is done by means of appointment to rôles based on former experience, or by public tryout, these records are necessary. Though the community be an old and established one, individuals are constantly coming and going, and in academic institutions the personnel upon which a director may call is rapidly changing. By means of these interviews a director builds up a group or staff of actors within the organization upon whom he can call to try out for rôles, or whom he may appoint to them, thereby combining the methods of casting.

3. *The Open Tryout Method*

The open tryout method may be used to select a staff or group of regular actors from which the director may appoint certain actors for, or call a limited number to try out for specific rôles in the play to be cast; or open public tryouts may be conducted for the casting of each new production. The latter method requires more time and probably is never as efficient as any of the other methods discussed when used as the only means of selecting a cast, but it has certain other advantages, especially when combined with one of the other methods, which makes the work it entails fully justified. Requiring applicants to try specific rôles in the play to be produced, whether in individual or general tryouts, affords the director an opportunity to see the actor in the rôle which he is seeking to fill. Whatever the method of casting used, no rôle should be "finally" assigned to an actor until he has tried it in either tryouts or early rehearsals. The open tryout method is usually conducted with a tryout committee aiding the director in making the selections. Some directors, as was indicated in Chapter I, prefer to share the responsibility and authority of the casting of a play with a capable tryout committee; others prefer to take the full responsibility and retain the sole authority. In view of the fact that many of the conflicts and jealousies which jeopardize the success of little theatre organizations arise over questions of choosing casts, it is perhaps wiser, more tactful, and more diplomatic to employ the committee method. When the committee method is employed, however, the director will have to guide the committee in its discussions and selections, and in cases involving a lack of unanimity his decisions should be final.

In academic institutions where dramatics is an activity of the whole student body, the committee and the open tryout method should be used at stated intervals, if not for each play. One of the greatest assets a director can have in dealing with students is a reputation for absolute fairness and impartiality in all phases of the work, and the open tryout and committee method in the choosing of actors will aid in establishing this. Nothing will more quickly plant the seeds of destruction in theatre organizations than the playing of favorites in the work. Unfortunately, the charge that most little-theatre plays are cast from a select inner circle, heard with especial frequency upon many campuses, is not without foundation. If the director employed in an institution in which dramatics is an institutional activity will reflect that he is employed to serve the whole institution, and that by so restricting his selection he is impoverishing his organization and depriving many students of training rightfully theirs, he will see that his best procedure is one of strict impartiality.

In this point of view, it is not meant to imply that the director in academic institutions must devote his theatre to "educational dramatics" to the detriment of artistic performances, but the question of whether a director in such an institution is primarily a teacher or a producer of successful shows is raised. The answer unhesitatingly is that so long as he is on the faculty of an academic institution, he is primarily a teacher. When his position as such is rightly considered, there is really no conflict in these views of his task, for finished artistic work is not at all incompatible with the best pedagogy. Should it be, then pedagogy should be revised. In truth, the more perfect the artistic work the better the teaching in its execution. There are certain limitations in the presentation of plays with student casts which may be incompatible with the highest artistic attainment. These limitations in academic dramatics, however, are often not nearly so stringent as those hedging about certain professional productions, restrictions of a different nature but no less irksome to the director and incompatible with perfect attainment.

4. *Conducting Open Tryouts*

The method of conducting open tryouts is relatively simple. A week or more before the tryouts the director places copies of the play to be cast in an accessible public place, such as the library, where prospective candidates for the rôles may have an opportunity to read and study it. He announces the time and place of the tryouts, and sees that this announcement is kept before the public by means of news stories and other avenues of publicity, in order that a large number of contestants may apply for rôles. Each contestant should make application for a tryout by filling out a card and presenting this at the theatre office prior to the tryouts. Upon the card should be the name, address, and the rôle or rôles for which the contestant wishes to try. Some organizations have cards printed for this purpose, upon which appears a statement of the conditions under which rôles are filled and to which contestants agree. These may be made of further service as records, if space is allowed for the listing of rôles played by the contestant in previous productions. These cards should be available at the time and place of tryouts for contestants who have not previously had an opportunity or have neglected to secure them. In the meantime the director selects a committee to aid him in the casting, and chooses the scenes from the play which are to be used in the tryouts. The specific scenes may be announced with the schedule of tryouts, and any scenes that are to be memorized indicated. Some directors prefer not to announce these scenes, because by doing so they may restrict the contestants' study to these rather than emphasize the study of the whole play. Other directors announce only the scenes to be memorized, but select other scenes to be read from the script. The scenes selected should not involve many characters, should involve a minimum of stage business, and should be sufficient to represent all the major characters and the range of the characters in their big moments. Leading rôles should be represented in several scenes, but minor rôles may be tried incidentally in the scenes devoted to the major characters or may be cast from scenes especially selected.

The tryouts should be conducted in the theatre or in a large hall or auditorium, in order that the power and quality of the voice of each contestant may be noted. Before the tryouts begin, the director may need to explain to the tryout committee exactly what he desires in each rôle, the nature of the interpretation which he will give to the play, and, if the members of the committee are not experienced, what they are to look for in the tryout of the applicants. When the contestants are assembled, a similar explanation of the interpretation of the play and the rôles may be useful to them. This explanation may have to be repeated, for if a large number of contestants apply for parts, or the play contains a large cast requiring the use of numerous scenes for tryouts, they may extend over parts of several days. In that case, the schedule of the specific rôles to be tried at each session should be announced, and the announcement repeated at the first sessions of the tryouts. These preliminaries accomplished, the director has an assistant call from the cards the names of the applicants who are trying for the first scene, and allows opportunity for the inclusion of any who may have been omitted. These applicants are assembled behind the scenes on the stage or near the front of the room, so that they may take their turns without undue delay and disturbance at reading the scene when called. From these the requisite number are selected to go upon the stage and read or speak the selected scenes to the best of their abilities. When this group has finished, a second group is called, and so on until all contestants have had opportunity to try the rôles in this scene or the other rôles in other scenes. The scenes must be short, but not too short to give the applicants a fair chance. Ordinarily, applicants should not be permitted to try a large number of rôles, but the director or the committee should request any applicant in whom they see potentialities to read any additional rôles other than the one tried, or to repeat his reading of a scene. This can be done usually without too much delay, because the unequal number of applicants for various parts makes some repetition necessary. It should be made clear to all applicants that they may be cast in parts for which they did not originally intend to apply. Some directors in conducting open tryouts, prefer not to admit into the auditorium or room any contestants other than those in the scene being tried, because a crowd creates noise and distraction and also because witnesses of preceding attempts are apt to imitate interpretations of the rôles. Perhaps the fact of imitation is significant in making the selection, and certainly there is some advantage in having an audience. At the conclusion of each session the next session should be announced and a statement made about when and where selections for the cast will be announced.

5. *Summary Outline of Procedure*

In order that the procedure in conducting open tryouts may be entirely clear, it is given here in a step by step outline, which will indicate what the director has to do:

1. Place copies of the play on reserve in the public library, theatre library, or some other accessible public place, where applicants may read them. This should be done at least one week before the first tryouts.
2. Announce through the various channels of publicity the date and place of tryouts, places where copies of the play are accessible, and any directions as to procedure in trying out. This should be done as soon as the copies are ready for the contestants, and should be repeated once or twice before the first tryouts.
3. Select a tryout committee and notify each member of the time and place of tryouts. Repeat this notification the day before the tryouts begin.
4. Select the exact scenes in the play to be used in trying out the various rôles. Determine the order in which the scenes and rôles will be tried.
5. Announce these scenes, if it is desirable to do so. Such an announcement may be utilized as material for a second newspaper story on the tryouts, thereby serving to keep the public aware of them. Whether the scenes to be used are or are not announced, the order in which the rôles will be tried should be.
6. Have applicants secure, fill out, and turn in at the theatre office, prior to the first tryouts, cards signifying their intention to try out for rôles; cards should be available at the place of tryouts for those who have not had a previous opportunity or have neglected to secure them.
7. When the contestants and the tryout committee have assembled in the theatre or in a large room with a platform, briefly outline the play, the nature of the interpretation to be given in the production, and indicate the general nature of each important rôle.
8. Announce the rôles to be tried out in this session and indicate the

scene or scenes to be read or recited by the contestants trying for each of these rôles.

9. Read the names of those who have applied for tryouts in these rôles and ascertain if any applicant's name has been omitted.

10. Request all these applicants to go upon the stage or to be seated near the front of the room in order to be ready to appear upon the stage without delay when called.

11. Have the assistant call the names of enough applicants to read the rôles in the scene selected. By having an assistant do this, the director is left free to observe the tryouts.

12. Have the applicants called appear upon the stage and read the scene. A scene may be repeated or an applicant may be requested to read several times or change rôles at the discretion of the director and the committee.

13. When all the applicants for these rôles have been given opportunity to try for them, repeat the procedure with the other rôles and scenes until every rôle has been tried and every applicant given a chance.

14. When tryouts extend over several sessions, announce at the end of each the time and place of the next. State also the method of announcing the cast.

15. Give every applicant a fair and equal opportunity, but do not let persistent boors render the tryouts tedious and unpleasant.

6. *Objectives in Casting*

The general objective which a director and a committee are endeavoring to accomplish in the selection of a cast may be briefly summarized by stating that they are seeking to determine the potential adaptability of individuals to the interpretation of the rôles in a play, in harmony with the aims of the design for its production. Specifically, they are seeking to answer certain questions:

(a) Is the applicant physically adapted to the rôle?—Is he of the approximate build and complexion that the rôle may demand; and will he effectively pair off with individuals who appear with him in other rôles? For example, if he is the young hero and lover of the play, is he tall enough to play opposite the person cast as heroine?

(b) Has the applicant an effective voice?—The voice must be strong, pleasing, and trained, as well as harmoniously expressive of the character. It must also be in harmony with the ensemble of voices. Care must be exercised in selecting two individuals who play opposite each other to avoid the confusing and unpleasant effect their voices will have if they are so similar in tone and pitch as to render them difficult to distinguish.

(c) Does the applicant possess, or does he have the ability to assume the characteristics of the rôle?—This consideration includes the mannerisms and idiosyncrasies, the features, and the special accomplishments of the character. For example, can the individual portray the characteristics of age in posture, walk, and gesture? Does he have features that are similar to or can be made-up to give the appearance of the character? Does he have the requisite accomplishments of the rôle; that is, can he sing, play a musical instrument, or dance, or can he learn to speak a dialect in keeping with the requirements?

(d) Has the applicant a conception of, or is he capable of developing and projecting a conception of the rôle?—This involves both his understanding of the character and his amenability to direction. An actor lacking in imagination, into whom a director has to pour every idea of the part as well as train in the execution, is a detriment to any cast. There are actors, on the other hand, who display in tryouts a facile if shallow perception of the rôle, but who are not capable of developing a deeper understanding or of taking direction in rehearsals.

(e) Is the applicant reliable?—Finally, after the other questions are answered, comes the question of the reliability and dependability of the individual. Will he work harmoniously with the director and the cast? If he is a student, his academic status likewise enters into this consideration.

Perhaps these five questions are as much or more than a director can answer in the selection of a cast by means of tryouts. To the results of the tryouts the director, as was noted in Section 1 of this chapter, will have to add the knowledge and experience he may have gained through previous work with the contestants. In the absence of such knowledge, he will have to be content with the selection of more or less exact types for the rôles.

7. *Type Casting*

A considerable amount of meaningless discussion has centered around the question of casting rôles according to type. Throughout the eighteenth and nineteenth centuries, when plays were written with specific type characters and companies were composed of actors who played type rôles, the characters in these plays were automatically assigned to the actors according to the type system. These companies were composed of a leading man and a leading lady, a soubrette, an *ingenue,* first business, second business, and so on. To some extent this organization prevails today in the stock companies and road companies playing one-night stands. In the casting of a play in these old companies, the various types of characters in the play fell by right to the actors who had played those types. In this sense no director today (with the exception mentioned), professional or nonprofessional, casts plays according to the type system. But every director, in the sense that he seeks for each rôle an actor that exemplifies the specific physical qualities and the mannerisms and characteristics of the rôle, may select his cast according to type. He does not place an actor with a pronounced serious, quiet, and reflective disposition in a rôle requiring a vivacious, sparkling, comic character. Only in the case of "educational or remedial dramatics," in which the aim is placed primarily upon the training of personality, will he do this. In the usual production he seeks a type of actor that will fit the rôle. In successfully accomplishing this, his greatest asset is a knowledge of his actors and of the success they have had in previous performances.

8. *The Cast is Selected*

To the inexperienced director tryouts may at first be a bewildering confusion, but experience will soon teach him to select for potentialities and development rather than for immediate finish. Some applicants, it may be repeated, will display their full abilities in the tryout, while others may give merely an indication of what they may develop in rehearsals. Only experience will tell the director how to differentiate between these. As soon as the tryouts are completed, the director and the committee then set about eliminating the less able to select the more gifted for the rôles. Sometimes the qualifications of one applicant will stand out so definitely that his selection will be unquestionable, but usually there will be several contestants of about equal ability, requiring careful consideration and nice discrimination for selection between them. Beginning with the leading rôles, it is best to eliminate all apparently unacceptable contestants first, retaining for further consideration each one favored by any member of the committee. Having narrowed the selection in this way, the committee and the director proceed further to narrow it (by discussion) to two or three applicants for each rôle. Sometimes, when there are a number of outstanding applicants for a rôle, a further tryout is held for them alone, or, preferably, they are permitted to attend the first rehearsals, their performance in which is made a basis for selection. Each rôle should be cast with an actor and an understudy. The selection of an understudy not only safeguards the production against any accidents which may occur, but it also provides training for a larger number of actors, thereby increasing the number available for future productions; and, further, it proves an effective curb to any tendencies toward "temperament" or indolence. As soon as the regular cast and the understudies are selected, they should be announced, along with a call for the first rehearsal. Not until after rehearsals have shown conclusively the fitness of an inexperienced actor, however, should he be allowed to consider a rôle unconditionally his own.

CHAPTER V

REHEARSING THE PLAY

A. The Rehearsal Schedule

The rehearsals of a play are designed to prepare it for presentation to an audience in such a way as to create desired and predetermined effects. In this preparation certain specific things are to be accomplished within a limited period of time; therefore, rehearsals must be conducted according to an orderly and well-planned schedule. If such a schedule is not prepared and adhered to, the director may find the date of the opening performance at hand and the last act not ready for presentation, or he may find much of the preparation of the play left unfinished to be crowded into the last few rehearsals. There have been, of course, plays "put on" by "torch bearer" directors by merely placing scripts in the hands of the casts and beginning rehearsals without any kind of plan whatever other than that of proceeding from act to act until the date of performance arrives. Such muddling procedure supplies the bulk of that ninety percent of amateur performances that are said to be not worth sitting through. If they "go over" at all, it is because they are performed for uncritical audiences, or because fortunately the cast includes some competent actors. Under either of these circumstances they are no credit to the director.

1. *The Function of Rehearsals*

There may be said to be seven major aims in conducting rehearsals, corresponding to seven divisions in the rehearsal schedule. These are:

a. Imparting to the cast a clear and definite understanding of the play, including each line, scene, act, and rôle;

b. Interpreting the play in pantomime and action;
c. Characterizing the rôles and perfecting the speaking of lines;
d. Coördinating the separate elements into a unified whole;
e. Perfecting the manipulation of the settings;
f. Orchestrating the whole composition;
g. Trying out the whole production.

The group of corresponding rehearsals in the schedule, for purposes of discussion, may be named as follows:

a. Reading rehearsals,
b. Business rehearsals,
c. Characterization and line rehearsals,
d. Coördinating rehearsals,
e. Crew rehearsals,
f. Orchestrating rehearsals,
g. Dress rehearsals.

The coördinating (d) and orchestrating (f) rehearsals are in reality a single unit devoted to the finishing of the play.

2. *Allotment of Time to Rehearsals*

The number of rehearsals to be allotted to each of these groups will depend upon the nature of the play and the amount of time available for the production. Some plays involving intricate pantomime will require a relatively large number of business rehearsals, while others, because of their nature, will require a larger emphasis upon some other feature. The director must use his judgment in blocking out the rehearsal groups on the rehearsal schedule. Opinions greatly vary, too, as to the amount of time to be allowed for the whole rehearsal schedule. There are directors, influenced no doubt by the Equity ruling, who maintain that four weeks are ample for the production of the average play. Indeed some are so partial to this period that they assert that a cast is apt to "go stale" if required to rehearse for a longer time. Perhaps they have failed to remember that only dead things which are no longer growing go stale. As long as a cast is learning and developing, there is no danger of staleness. A trained and talented director with an intelligent and gifted cast can continue this process of growth toward perfection indefinitely. The argument of professional precedent is of no validity when applied to a nonprofessional cast. The professional cast is made up of trained and experienced actors who do not need to be taught the rudiments of their art. Further, acting is their profession, to which they can devote their major energies and a large portion of their time. In their work they are under an economic compulsion not felt by nonprofessional actors, who are usually engaged in the art as an avocation. The major energies of the latter and most of their time must go into other occupations. And only in exceptional cases are they thoroughly trained in the rudiments of acting. With many of them the director must spend long hours in drill on the fundamentals. It is then an optimistic director indeed who expects to accomplish in four weeks with nonprofessional actors what most professional companies do none too well in the same length of time.

Frequent repetitions over a considerable period of time are requisite for the nonprofessional actor to master a rôle, learn to execute business with ease and naturalness, learn to speak lines effectively, and acquire all the other accomplishments necessary for a finished performance. The answer then to the question of how much time the director should allot to the rehearsals of a play is as much time as it is possible to allow, and this will more frequently be too little than too much. In academic institutions the schedule and calendar of campus and school events will effectually curtail this time, to say nothing of holidays and opening and closing dates. These and examination schedules must be considered in scheduling rehearsals and dates of performances. In community theatres the amount of time that actors are willing to or can afford to allot to the undertaking along with the occurrence of other community events will prove a no less effectual barrier to the undue extension of the time factor. Compromising as he must be with all these, the director ordinarily should attempt to secure at least five weeks of rehearsals for an average modern play, and a proportionately longer time for the revival of period plays and modern plays which offer unusual difficulties. Often he may have to crowd the production into a shorter time, but only with the most exceptional advantages in his favor should he attempt to produce an average full-length play in less than four weeks. Plays with large casts and many scenes, and difficult period plays, such as those of Shakespeare, should, if possible, have at least eight weeks of rehearsals. Certainly that does not appear excessive when we recall that one of the best productions the Moscow Art Theatre ever gave was rehearsed for two years. The records do not reveal any signs of staleness on the part of any of those actors. But this is the land of Rush, not Russia, and most directors here are forced to make stringent compromises with the factor of time.

3. *The Rehearsal Period*

These recommendations concerning the length of time for preparing a production have been based on the assumption (which generally prevails in little-theatre work) of one rehearsal each day for six days of each week (with the addition of any drill periods that may be necessary, which will be discussed later). Another time factor which the director must consider is the length of each of these daily rehearsal periods. This factor, too, is frequently conditioned by demands made upon the members of the cast in their various other pursuits. Because of such demands it is sometimes difficult, especially in community theatres, to schedule a consecutive series of rehearsals with the full cast. But in view of the fact that a great portion of the director's time must be spent in instructing and drilling individuals in their specific rôles and small groups in difficult scenes, this limitation need not prove too irksome if rehearsals and drill periods are properly scheduled in advance. In both the drill rehearsals and in the regular rehearsals with the fuller cast, the director is engaged in teaching and the cast in learning. In this, as in all other learning processes, the element of fatigue enters. When rehearsals are continued for too long a period, this element greatly diminishes their value. Experience has shown that two rehearsal periods of an hour, or an hour and a half, are more effective than a single period of five or six hours.

We learn more readily by repetition after intervals of rest than we do in a single long tiring effort. The rehearsal period should rarely be continued beyond three hours, and then only in exceptional instances, such as that of the first study rehearsal, some of the orchestrating and finishing rehearsals, and the dress rehearsals. On the other hand, if the period is an hour or less in length and if corrections and repetitions are frequent, it will not be possible to complete the rehearsal of a full act in the time available. Considering each of these, directors have found the two-hour period about the right length of time for most rehearsals. This period will allow ample time for the rehearsal of a whole act and is not of sufficient duration to permit the element of fatigue seriously to diminish effectiveness.

4. *The Drill Period*

Even when these regular rehearsals are accurately planned and properly conducted they are usually not sufficient for all the training that must be accomplished. There are few full-length plays that can be adequately prepared with nonprofessional casts in thirty rehearsal periods of two hours' duration. It becomes necessary, therefore, to supplement these regular rehearsal periods with periods of intensive drill. Even though a greater length of time is available for regular rehearsals, these drill periods are still desirable in the training of nonprofessional actors. These periods may range in time from a quarter of an hour to a full hour, and may be scheduled at any time to suit the convenience of the actors and the director. Scenes of complicated action and business, such as the fencing scene in *Hamlet* in which Hamlet and Laertes must exchange swords, or the scene in *A Doll's House* in which Nora dances the tarantella, can be much more readily perfected in several short periods of repeated drill under direction, where entire attention is focused upon one thing, than in the longer rehearsals devoted to larger units. In the same way, individual characters and speeches can be given the benefit of more intensive drill. Every important scene in each act should be perfected under direction in short drill periods given over exclusively to the single scene. An individual actor who needs coaching in the use of his voice, in the characterization of his rôle, or in the enactment of any big scene may be given more effective instruction in a series of such drill periods. In the beginning of this intensive instruction the scene, or character, or piece of business, should be thoroughly analyzed, broken up into its component parts, laid out step by step, and then by repeated drill made so much a part of the actor that its execution becomes automatic. Only by some such process as this will those difficult and troublesome elements acquire a smoothness of execution that gives professional finish to the whole. Almost all nonprofessional and many professional actors need these periods of more intensive work. In them the director can teach the actor how to make his entrances and exits, how to walk and stand on the stage, how to sit down and rise gracefully and in character, how to handle properties, how to secure volume and project his words; in them he has opportunity to teach the fundamentals of the actor's art which the individual must employ in the interpretation of his rôle. The regular rehearsal period does not allow time for all this; if it did, it would be at the expense of others of the cast not concerned. Such a schedule of drill periods should begin as soon as the play is put in rehearsal, and should continue as long as there is need for them. They will greatly relieve the burden of the regular rehearsals and aid in making them more valuable and pleasant for everyone. The nature and number of these periods of drill will vary according to the nature of the play in production and the abilities of the cast interpreting it.

5. *The Schedule of Regular Rehearsals*

Because of this variation the director will have to use his discretion in scheduling the drill periods after he knows the play and the cast. A similar variation obtains in the scheduling of regular rehearsals, as has been pointed out, but for purposes of discussion a blocking out of the rehearsal periods that may be allotted to each group of rehearsals is indicated below. Assuming that the play is to be produced with five weeks of regular rehearsals, and that it is a modern full length play offering the average difficulties, such as *A Doll's House*, *You and I*, *The House of Connelly*, or *The Show-Off*, the schedule may be planned as follows:

1st	Rehearsal	Period	Reading rehearsals of the whole play, and intensive study of the first act.
2	"	"	
3	"	"	
4	"	"	Business rehearsals of the first act.
5	"	"	
6	"	"	
7	"	"	
8	"	"	Reading rehearsal of the second act.
9	"	"	Characterization and line rehearsal of the first act.
10	"	"	
11	"	"	Business rehearsals of the second act.
12	"	"	
13	"	"	
14	"	"	Reading rehearsal of the third act.
15	"	"	Characterization and line rehearsal of the second act.
16	"	"	Rehearsal of the first and second acts together.
17	"	"	Business rehearsals of the third act.
18	"	"	
19	"	"	
20	"	"	Characterization and line rehearsal of the third act.

21	"	"	Coördinating rehearsals of the whole play.	The finishing rehearsals.
22	"	"		
23	"	"		
24	"	"	Orchestration rehearsals of the whole play for action, movement, tempo, rhythm, and timing.	
25	"	"		
26	"	"		
27	"	"		
28	"	"		
29	"	"	Dress rehearsals (the tryout performances).	
30	"	"		

Such a schedule of the rehearsals requires some further explanation. According to the above outline, work on the second act begins before the first act is completed, and on the third before the second is completed. The director who waits until his first act is completely finished before beginning work on the second and insists upon a similar finishing of the second before starting the third in rehearsals, will be apt to find little time left for finishing the third act or polishing the whole play. Such a procedure is apt to result in a finished first act and a ragged second and third. After business rehearsals are started on the second act, the first should not be neglected. It should be run through from time to time at the beginning or end of the rehearsal periods. As soon as the second act shapes up, the first and second should be run through together from time to time, as intensive work proceeds on the third. Adjustments must be made in the schedule and order of rehearsals to accommodate this. As soon as the reading rehearsals are completed or after the business rehearsals begin to show the need of them, drill periods should be scheduled for specific scenes and actors. Crew rehearsals have not been indicated in this outline, because they are usually called and conducted by the technical director or his stage-manager and do not involve the cast. At least three crew rehearsals should be completed before the director begins his coördinating rehearsals; which is to say, that all of the elements of the setting must be complete and ready to operate by the beginning of the fourth week. Sometimes the production demands of a play are so heavy that this cannot be accomplished. In that case the director and the cast will have to suffer the handicap. But the play cannot be properly coördinated in production, and certainly cannot be orchestrated, without the complete setting. Since, in most little theatres the rehearsal schedule has to be adjusted to the convenience of members of the cast, most rehearsing of nonprofessional productions is done at night. More can usually be accomplished, however, in morning rehearsals, when members of the cast are fresh and less fatigued.

B. Conducting Rehearsals

Before proceeding to the discussion of the major groups of rehearsals, some general suggestions on conducting rehearsals may be made. In this work the personality and ability of the director are of paramount importance. He must be a manager, a teacher, and a leader, as well as an artist. Only the director lacking in personality and the qualities of leadership, and unsure of his knowledge and ability, resorts to screaming at his cast or employing sarcasm. Most nonprofessional actors are working without remuneration for the love of the work and the training they may derive, but the pleasure and training are not worth the discomfort of effort under such a director. If the director knows his work, conducts his rehearsals in a systematic and orderly manner, and develops a proper morale in his staff and cast, he will find no necessity for recourse to discourtesy or abuse. Strict attention to the business in hand, firmness, tact, impartiality, and courtesy will aid any director in building up a devoted following in his organization.

Frequently the statement has been made with some justification that amateur dramatics is nothing but a waste of time. The trained director who organizes and schedules his rehearsals and drill periods in an orderly way and conducts his work in a systematic fashion will obviate this criticism. Rehearsals should invariably begin and end exactly on time. No director should permit any member of the cast to be absent or tardy for rehearsals. If an Irish bull may be permitted, it may be said that no member of the cast should ever be permitted to be absent, and should be excused for tardiness only in case of illness, marriage, or sudden death; and that if any of these happens too often, he should be dropped. A director can much better afford to lose a good actor than countenance the loss of the morale of the whole cast. Firmness in this respect will save the director and the members of his cast many hours of agony. After the dismissal of one or two offenders, there will be little to complain of in the matter of punctuality and attendance, provided the director holds himself to the same stringent requirements. Nor should the actor's time be wasted. Actors should be called for rehearsals only when needed. An actor whose rôle in the scene or act does not appear until near the end should not be required to sit around idly from the beginning of the rehearsal period. Attention to the scheduling of the calls and drill periods will conserve time for many of the cast and prevent the criticism of waste. Tedious drilling of a single actor or repetitions of a scene involving new actors should, as has been explained, be relegated to the drill periods.

The rehearsal period should at all times be devoted strictly to the work in hand; it should be as serious and as intensive as any period of drill upon the football field. Concentration is absolutely necessary for successful achievement. Inattention to duty and undue levity at rehearsals must not be countenanced. There are plenty of opportunities for fun and enjoyment in the theatre, but they must not be permitted to undermine the serious nature of its artistic work. This is to say, by no means, that rehearsals must be a grind; they can and should be a pleasure. When the director and every member of the cast are working harmoniously together as artists for the achievement of a production which will reflect credit upon all, the work may be exacting but it will be enjoyable.

The theory underlying rehearsals is the theory of learning by intelligence and concentrated repetition. As has been said, this repetition must not continue to the point where fatigue decidedly diminishes the returns, but it must be so frequent that what has been accomplished in one rehearsal will not be forgotten before the next. Furthermore, anything once acquired by repetition is difficult to unlearn and replace by something else. Business and the interpretation of lines should not, therefore, be set by repetition in rehearsals if they are not correct and to be retained. In order that the whole interpretation may be correct from the beginning, the director begins the rehearsals of a play with the reading rehearsals, in which business, characters, lines, and all other elements of production may be clearly explained and discussed with the cast before it is placed upon the stage.

C. The Reading Rehearsals

The reading rehearsals are devoted entirely to the study of the play. The entire cast, including understudies and alternates, should be assembled in a large room or on the stage. For these rehearsals the stage is not at all necessary, however; indeed, a large room with comfortable chairs, a large table, and a blackboard, is preferable. In these early rehearsals the director attempts to teach the cast what he has learned about the play, and to give each member a vivid idea of the dominant effect and the unifying idea aimed at. One of the best ways of doing this is to begin with a discussion of the whole play, explaining its theme or central idea, its situation, its characters, its dialogue. These should be commented upon, illustrated, explained until the play is no longer a printed book, but a living vital thing. Through this presentation the cast must see the people in it as living, thinking, feeling individuals actually entangled in the situation. In all of this discussion the director is not attempting so much to force his ideas upon the actors, as to kindle their creative imaginations, to strike a spark that will eventually glow in a warm bright light of understanding and emotional identification. To this end the cast should be encouraged to ask questions and add comments.

6. *The First Reading*

When the play has thus been brought to life, the first reading can begin. Before the reading of each act, the director should fully and minutely describe and explain the setting, using diagrams and drawings freely. He must have at least a floor-plan of each setting. If sketches or models have been made for the sets, they will greatly aid the cast in realizing the environment in which as characters they must live. The exact position of each piece of furniture, of every important stage prop should be clearly defined. After each member of the cast has been supplied with a copy of the script and a pencil, the reading begins. Some directors prefer to read the play to the cast; others object to this on the score that it tends to produce imitation. It would seem that the latter would occur to any dangerous degree only with very immature actors, and then only with those who had little or no imagination of their own. Indeed, the question might be asked: What is wrong with imitation anyway in the beginning of an artistic endeavor? Apparently all great artists and all great art began by imitation. It is only when art continues to be mere imitation that it becomes valueless and dangerous. If the director is capable of it, and if by that means he can best induce conceptions of the characters and fire the imaginations of the actors, let him enact every rôle in turn in these first rehearsals, provided always that he never permit an actor to continue rehearsal after rehearsal in a mere copying of his portrayal. Some directors have the cast give the first reading of the play, because when this is done, the director is left free to correct and explain errors and omissions during the reading. Here once again the method employed rests entirely with the director, and he may vary it from play to play. The entire play should be gone through at the first reading, in whatever way chosen.

In order to complete the whole play within a reasonable time, too much comment and explanation cannot be injected into this first reading. The main idea is to clarify the play and the characters, to show to the cast the settings, to give each member a distinct idea of the sweep and range of the play and the progress of the entire action, and to make clear the dominant effect aimed at. With all this accomplished, the next reading rehearsal should begin with the first act. Members of the cast should read it through, aided by the director's explanations and criticisms. Every important speech in the act should be thoroughly explained, so that the actor clearly sees what emotion motivates it, what it means, what place it has in the scene, and what it is aimed to do. At the same time every piece of business, all action accompanying the dialogue or occurring in any scene should be fully indicated and described. To clarify all complicated business, and to point out entrances, exits, and crosses, reference may be made to the floor-plan of the set. Each member of the cast concerned should be required to write in his copy of the script clear directions for all actions, business, and stage movement. These must become a part of his study of the script to be associated always with the dialogue. The director will need to make it clear, however, that certain modifications may be necessary and certain new pieces of business may be added when the business rehearsals are under way. Therefore the actors should write business directions into their scripts with pencil. Along with this, any ideas as to how and what to study in mastering the character should be given at this time. Novels or stories containing similar characters, individuals in real life known to the director or to the actor, essays and commentaries on the character or on former interpretations, and pictures and illustrations may be suggested for the actor's use. The deeper, fuller, and richer his insight into the character, the more brilliant will be the actor's portrayal of the rôle. In the very beginning it should be insisted that every part in the play, even the smallest rôle, can be made an effective characterization if the actor but have the imagination and make the effort to do it. Unless the play is one of the old melodramas or one of the recent stylized plays, the director must urge that no part in the play be looked upon as a type. The most unsympathetic character in the play must be viewed with a sympathetic imagination by the actor who essays the rôle. As that character he must proceed to build up a justification for himself and his actions; he must begin to feel in the rôle as that character would feel in real life. Indeed, for the time being the situation of the play must be "real life" for the cast. Only in this way can the director attain that sincerity of character portrayal that goes far to compensate for the lack of skill and professional finish on the part of the actors. After the first act has been explained scene by scene, line by line, the act should be read over and over by the cast with corrections and comments from the director. Thus, early in the rehearsals, the director is able to signal out those individuals who will need specific and individual instruction.

7. *Final Casting*

As soon as the play has been clarified in this way, the director should make his final choice of actors for the rôles. Already perhaps, as different actors have taken turns at reading a certain rôle, it has become clear which one will do the part best. If this has not occurred, the director should hold an elimination tryout, in which each actor competing for any rôle is given an opportunity to read an extended scene or scenes with actors in the other parts. The director should reserve the right to turn down all the contestants even after the rehearsals have begun, and to call in some other individual to play the part. He should resort to this, however, only when the superiority of the new actor is clearly evident. With the cast and understudies selected, the director should announce the time and place of the regular rehearsals and the schedule of drill periods, in so far as they have been made out.

8. *Number of Reading Rehearsals*

There is one further question in connection with these reading rehearsals concerning the amount of time that should be given over to them; that is, how many of the regular rehearsals should be allotted to them. An indefinite amount of time, if available, can be utilized to advantage, especially with Elizabethan and other plays of past periods. This work lays a solid foundation for the rehearsals that are to follow, and every minute spent in it fully repays the director and the cast. With the average contemporary play that must be ready for opening within five weeks after it is cast, however, usually not more than three or four regular rehearsals can be allotted to this group of rehearsals at the beginning, and an additional one for each act succeeding the first. The average three-act play would therefore require about five or six periods of rehearsal time for the reading rehearsals.

D. Business Rehearsals

9. *The Purpose of Business Rehearsals*

With a clear conception gained from the reading rehearsals of the play, the effect aimed at in its production, the characters, the layout of each setting, and with a general idea of the business as the director has designed it, the cast is ready to begin the business rehearsals. The director's object in these rehearsals is to perfect the composition of the business, to teach it to the cast, and to train the actors in its execution, by means of repetition and direction. It may be stated again that the design of the business as previously worked out (see Chap. III) will probably undergo considerable change, especially in the execution of its details. The purpose of these business rehearsals is not necessarily to give complete and final finish to the business of the play, but to establish and set it in relation with the lines which it accompanies and illustrates, the characters which it projects, and the environment in which it occurs. The conducting of these rehearsals, therefore, involves a consideration of the other organic elements of play production—lines, characters, setting. In the business rehearsals primary attention is centered upon the action of the play, but because they are parts of an organic whole all the elements involved in the production must be considered in the preparation of any one. That is one of the reasons for a director's designing his whole production prior to undertaking any rehearsals (see Chap. III), and for conveying the whole design to the cast in the reading rehearsals at the beginning of the schedule.

10. *Business Defined*

The business of the play may be defined as the action and movement used by the characters to project in an effective and pleasing manner the whole meaning of a play. Broadly speaking, it includes the pantomime and gesture of actors in the enactment of their rôles, but in this discussion gesture will be considered as belonging more specifically to the art of the actor, and will be included only incidentally as it may relate to the pantomime. The nature of drama makes the consideration of business of paramount importance in the production of a play. Aristotle in defining tragedy said that a play was "an imitation of an action . . . in the form of action, not of narrative." Disregarding the crux involved in the double meaning of the term action, this early definition of a play reveals the basic nature of business in drama. In the interpretation of a play for an audience, it is one of the three major mediums of expression (the other two of which are the lines and the setting). Business in this discussion may, therefore, be used as synonymous with action to mean any movement exclusive of simple gesture used by an actor or a group of actors in the enactment of the play. Its elucidation demands (1) a consideration of the nature and function of business, (2) a consideration of the principles of design in its composition, and (3) a consideration of the practical aspects in its enactment upon the stage.

(1) The Nature and Function of Business

11. *Types of Business*

In the planning of business it may be divided into two allied types: requisite and supplementary. The requisite business is that absolutely essential action necessary for telling the story, such as entrances, exits, certain crosses, and movements required by the nature of the story told. The skeleton of this business is found in the text of the play and in the stage directions included by the author. In modern plays with copious stage directions and in acting versions of contemporary or old plays the requisite business may be fully indicated, but in the laying out of the business of any play in keeping with his design of its interpretation the director usually has to change and add to this business. Especially are the changes and additions necessary in the staging of plays written for a different form of stage, such as those for the Elizabethan or the

Greek stage, and when the interpretation requires a rearrangement in the setting. Supplementary business, on the other hand, is business inserted for clarifying or vivifying the action, for characterizing a rôle, or for compositional purposes. The basis of this business is also found in the text of the play, and may in part be indicated in the stage directions. The major portion of it, however, is added by the director in his composition of the action, and by the actor in his interpretation of the character. Both types of business may be illustrated by reference to Hamlet's famous soliloquy beginning "To be, or not to be" (Act III, Scene 1). The business preceding this soliloquy which is designed to get the other characters (the King and Polonius) off the stage is requisite business, but the gesture and movement used by the actor playing Hamlet to clarify the words spoken and to project the thought and feeling behind them is supplementary business. The latter varies with each actor who plays the rôle.

From the standpoint of execution business may again be divided into two types: business executed by a single actor, and business involving a group. The first, which includes such pieces of business as entrances, exits, and crosses, as will appear later, may frequently involve more than one actor and thereby demand consideration in connection with the second type.

From what has been said here, and as will become more fully apparent in the discussion of its execution, it will be seen that the business of a play, like its whole production, is a coöperative undertaking. It is supplied by author, actor, and director. Its projection demands the coöperation of actor and director, and its execution that the actors supplement and assist each other.

12. *The Functions of Business*

In the preceding discussion the three major functions of business have already been stated. For clearness they may be summarized as follows: The functions of business are:

a. To aid in telling the story,
b. To reveal characters,
c. To render effective and interesting the composition of the action.

13. *Business Tells the Story*

Perhaps the most important and in a sense the inclusive function of business is to tell the story of the play. The long history of pantomimic performance shows how completely a whole story of even very complicated and involved action may be revealed to an audience. The old "silent movie" with only a few captions thrown upon the screen could be followed by everyone in the audience, including the children. Today, although the perfection of talking devices has brought conversation into the cinema, a large part of the performances are still made up of pantomimic action. Pantomime is used on the legitimate stage today to a less extent than in any previous period. This is in part due to the psychological and inward nature of action in modern plays, but is probably more largely due to the modern actor's ignorance of and training in the art. Perhaps this is one reason why at the present time the large popular audience in America loves the cinema almost to the exclusion of the legitimate theatre. There is an old adage that says "actions speak louder than words," which is certainly true for the average audience in the theatre. On the modern stage, action is not so much an end in itself as a method of aiding, interpreting, and enforcing words in their telling of the story and revelation of character. When prepared for and accompanied by words, actions do speak louder, and they render words more intelligible to an audience. Further, the thoughts which the poet says lie too deep for words, may be rendered in pantomime. When words fail, or seem banal or sentimental and out of keeping with the tone, pantomime may often silently accomplish what sound cannot.

14. *Business Aids Characterization*

One of the first things that a playwright learns about characterization as a part of his craftsmanship is that characters on the stage should not be characterized by what they say or what is said about them alone. These must be enforced and illustrated in their actions, in what they do. Aristotle said "in the form of action, not narrative." To the actor, therefore, the art of pantomime is essential in revealing and expressing the character of his rôle. The slow hobble across the stage will do far more than mere words to convey the impression of age in a rôle. It is said that Garrick could by his appearance alone, his walk, posture, facial expression, use of eyes and hands, create a complete character without speaking a word. Certainly few great character creations on the stage would retain all their effectiveness without the business. Through the business of a rôle an actor can etch in bold terms the thought and emotion behind the words, but only implicitly in the words when they are read without the accompaniment of action. The furtive wiping away of a tear, the beseeching lifting of the hands, and dropping them at last with a sigh in hopeless resignation, the quick angry clinching of a fist and involuntary step toward an opponent may make the meaning and emotion of a character or scene stand out in such boldness that no one in the audience will miss it. Herein lies the greater value and effectiveness of the public performance of a play over a public reading. To this end, therefore, the director and the actor should work out in minute detail every piece of business to be employed. The large skeleton of requisite business the director will work out for the most part, but the supplementary business especially related to the characterization of the rôle he is playing will be worked out by the imaginative actor himself in the creation of the character. Suggestions and additions designed to stimulate the actor's imagination should always be made by the director.

15. *Business for Compositional Purposes*

In addition to these, there is a third function for which a director may introduce a piece of business into a scene: The nature of the scene or the requirements of the action may make it necessary for compositional purposes. To illustrate, there are often in plays long, unbroken, talky scenes, which are apt to become monotonous if not broken up with action. In the production of the one-act play, *Job's Kinfolks,* by Loretta Carroll Bailey, it was found that the fourth scene, in which after her entrance Kate sits and talks with her aged mother, Kizzie, tended to become static and lose interest. In order to break it up and give it movement and interest, the director introduced a piece of business not in the first version but later included in the printed play. He had Kate examine the lining of her coat as she removed it, go into another room, return immediately with a sewing basket, and while she sat and talked with her mother, mend the tear. By this means naturalness and variety were added to the composition of the scene, and it became more interesting and effective. Into the same play the director introduced other pieces of business primarily for compositional reasons, but made them, like the above, vehicles of character revelation. Some of the latter pieces occur in the scene in which Estelle, the good-natured, red-headed, talky neighbor, comes in "to sit" with "Miss" Kizzie, while "her folks" are gone to the "movies." In order to break this scene up and to render the comic relief value of Estelle's character, the director had her during her conversation ostensibly scratch her leg, eat some pieces of cake left on the table, walk around the table to see a calendar hanging on the wall, and blow the dust off it. Frequently in the composition of a piece of business the director finds that a needed character is on the opposite side of the stage and must be moved over. For this purpose he must invent a piece of compositional business, which may involve nothing more than a simple cross. But if the simple cross is not planned and executed according to certain specific requirements of good business, it may destroy the illusion and violate the character. In the same way, business must be planned for other compositional purposes, such as the maintenance of the balance of a grouping, which will be more fully discussed later.

16. *Major Characteristics*

All good business must have two major characteristics: It must be interesting, and it must be expressive. If a director is to attain these two objectives in the planning and execution of the business of a play, it must be done in accordance with five requirements.

17. *Five Requirements of Business*

The five requirements of interesting and expressive business are:

a. It must be clear,
b. It must be motivated,
c. It must be harmonious,
d. It must be significant,
e. It must be composed in keeping with the laws of design.

18. *Clearness*

The only excuse for the introduction of a piece of business in a play is that it may serve as an aid to the audience in the understanding and enjoyment of the play; it is, therefore, self-evident that every piece of business should be clear and unconfusing. Hypermodernistic artists to the contrary, no work of art can be great that is totally confusing and lacking in clearness. Business on the stage may be confusing and lack clearness because it is not prepared for and motivated, because it is too complex and indefinite, because it is hidden, because it is not properly pointed. Motivation will be more fully considered below. A piece of business led up to and prepared for by means of words gains greatly in effectiveness because it follows a preparation that makes what is happening perfectly clear. Were a character suddenly and without warning to pull a pistol from a desk drawer and shoot another character for no apparent reason, the action would be puzzling to an audience because its motive was not made clear by means of proper preparation for the action. The usual impulse of an audience confronted and puzzled with such a piece of business is to laugh. The same bewilderment will result from a piece of business whose idea is too indistinct or indefinite and whose execution is too complex. Vague and meaningless actions have no place on the stage. Every piece of business should be clear-cut and distinct in its meaning and execution. It is a well-known law that a playwright must never confuse nor fool his audience; it is just as important that the director never do so. This, of course, does not rule out the possibilities of business being used for the creation of suspense. It means that what the director has the actor do must be simple and apparent enough for the audience to follow every movement, although it is held in suspense concerning the full significance, meaning, or outcome, of what is being done. Further, any piece of business to be clear to the audience must be out in the open so that the audience can see it. In planning and rehearsing the business the director must take precautions to prevent important pieces of business from occurring behind tables or furnishings that may obscure them, or from being played with the actor facing too much up stage, and to prevent one actor in his execution of business or speaking of lines from covering other important characters. Too often the nonprofessional actor tends to gravitate to positions behind tables or chairs, thereby leaving only the upper portion of his body visible. In rare instances there are pieces of business that are pointed by being so played, but these are effective only if the reason for the position assumed is clear. There are instances, for example, when in a group gathered about a table or a sofa some actors become partly hidden. These groups must be arranged so that the leading actors in them are not those so concealed. A trained actor is so conscious of this necessity for clearness that he will almost automatically "uncover" when he is covered or is covering another. The director must teach this habit to inexperienced casts. The sight lines from the audience to all important actors on the stage should remain unobstructed at all times.

19. *Pointing*

An action may lack clearness because it is not properly pointed; that is, because the attention of the audience is not focused upon and directed toward the central part of the action. This principle of directed interest applies specifically to business involving grouping. As will be made more clear in the discussion of design, any grouping must have a center of interest determined by the meaning of the grouping and the object or figure upon whom the meaning centers. In order that the meaning may be apparent and clear, attention must be focused upon this center of interest. This is done on the stage by having each of the supporting actors in a group turn toward, gesture toward, look at, give attention to, or appear to do these things to, the character upon whom the audience's attention is to be focused; that is, upon the actor who has the scene.

If this practice, known as "pointing," is properly executed, the audience, without consciously realizing why, will concentrate its attention upon the figure in the group whose scene it is, and thereby be able to follow with clear understanding the action and meaning of the scene. A grouping on the stage consisting of five actors, each of whom faced, gestured, spoke, and seemed to fix attention in a different direction, would be completely confusing to the audience. Such a grouping would need to be unified and pointed to a specific meaning and upon specific actor or actors. A warning should be added however, that it is not meant to imply that an actor, in order to point and direct attention, need stare continuously at the central figure opposite him. That would be unnatural in life or on the stage.

20. *Motivation*

The major requirement in planning and executing any piece of business is that it be motivated. Motivation means that it must have a purpose, a reason, a motive for being done, which is perfectly clear to the audience. In life some people may do things impulsively and for no explicable reason, but on the stage the reason for every action must be clear if it is not to confuse the audience. The action of a play proceeds in a causal relationship, and not in mere chronological sequence. This is the essential differentiation between the dramatic narrative and the mere narrative. Consequently, every action in a play must be clear in relation to its cause and its effect, which is to say that it must be motivated. In the preceding discussion of the functions of stage business it has become clear that a director may introduce business in a play for any of three reasons, but to the audience it must appear to be there for one reason only—because that is precisely what that character, being what he is, would have done under the stimulus of those emotions in the exigencies of such a situation. Whether the business is introduced to tell the story or to aid in characterization, or because it is needed for technical and compositional purposes, it must in its execution be made to seem to come out of the character performing it and to be exactly what he would do under those circumstances. In the final analysis then, the motivation for every action on the stage is character. Under no circumstances, therefore, must an actor be made to perform a piece of business that is not in keeping with or would violate the character of his rôle. More than that, every action for whatever purpose introduced, must be so planned and executed that it seems to spring from the inner impulse of the actor performing it. In this way, whatever other function it may have, every piece of business becomes a vehicle for character revelation. The slightest gesture or move on the stage, such as a step or so to the side to uncover a hidden actor, may be made an eloquent expression of the character performing it. The accomplishment of this in the execution of the business is largely dependent upon the genius or talent of the actor, but the director can and must call the actor's attention to it and stimulate his imagination in the performance of it.

While motivation in its last analysis resides in character, the incentive to action upon the stage may be said to be external (stimulus from outside the character acting upon the character) or internal (emotions or thought within the character impelling him to act). To illustrate the first: A knock is heard at the door; the character sitting by the fireplace rises, crosses to the window, peers out, crosses to the door, and opens it. The incentive or stimulus came from the outside. The internal incentive to action may be illustrated by another example taken from Paul and Erma Green's one-act play, *Fixins:* Ed, a young farmer, formerly a tenant is possessed with one consuming desire, to own land and more land. His pretty young wife, Lily, in order that life may not be just a slavery amidst drabness and dreariness, wants "fixins" for her home rather than more land. Mr. Cooper, a big landowner out of funds, in an attempt to sell Ed another piece of land, tells him that he has heard that Lily is over in town running around with another man while he is slaving alone here on the farm. After accomplishing his purpose with this vicious gossip, Mr. Cooper departs with Ed and Lily's money in his pocket, leaving him alone cooking supper. As Ed moves awkwardly about the stove he hesitates in his work, seems about to go toward the inner room, but again turns to the stove. It is evident that he is worried, that he is becoming angry. His movements about the stove show this. He sees a blue vase, picks it up, and smashes it on the floor in a burst of violent anger. At last he shoves the cooking utensils savagely to the back of the stove, strides wrathfully into the other room, returns with clothing in his hands, sits down and begins removing his heavy shoes. At this moment Lily returns. It is apparent that the stage business here is actuated by the inner incentive of jealous anger. To be sure, that which set it in motion was an outward thing, the gossip reported to Ed about his wife. So must all important stage business, as has been indicated, be led up to and prepared for by outward word or deed if it is to be fully effective and clear. By just such preparation the action of breaking the vase is rendered especially effective. The vase, it is explained, is in this bare, drab tenant farm kitchen a cherished possession of the wife's, a symbol of her longing for a little color and beauty in her dreary surroundings. It is also clearly explained that this same longing was in part the incentive that caused her to leave her husband alone on the farm and go visiting in town. The breaking of the vase, therefore, reveals something more than the anger of Ed expressing itself in physical violence. It becomes symbolic of the whole conflict of the play. This piece of business properly executed speaks eloquently to the audience, because it is prepared for and motivated, because it is clear and easily understood, and because it has meaning.

21. *Harmony*

The business in *Fixins* is interesting and expressive because it is in harmony with the characters, the mood, the meaning, the lines of the play. A piece of business to be in harmony with a character must be motivated in character and executed in keeping with the nature of the character. Proper motivation in the planning and execution of action will work greatly toward making the action harmonious also with the mood and meaning of the play, for these are largely controlled by the nature of the characters. The action of a play must be in harmony not only with the play, but also with the scene in which it occurs. That is, it must also be in keeping with the mood of these, and the tempo and rhythm of its design must be harmonious with these. Every piece of business cannot be made as harmonious and expressive of the conflict of the whole play as was the breaking of the vase, but when it is possible to plan and execute it with this larger harmony, it becomes much more effective. Business must also be planned and executed in harmony with the lines in a play. There are certain lines known as action lines, which demand action to interpret them properly. Other lines demand no movement in their interpretation. The harmony of line and action may be illustrated by the old joke of the actor who as he spoke "Here I take my stand upon this rock," paced agitatedly back and forth across the stage. The harmonization of line and interpretative action usually, however, requires a much more subtle perception than that required in the above instance. As will be seen in the following section on characterization and lines, there must also be a harmonization of the rhythm of lines, business, and character.

22. *Significant Action*

An exit or a cross, or any piece of business, whatever its special function, is never merely a means of getting an actor from one point to another, or on or off the stage. It must be made to express character, to contribute to the meaning of the scene, to be a carefully integrated element in the totality of effect aimed at. Like a motif in a symphony or a movement in a ballet, a piece of business cannot be permitted to go wandering off at random playing any tune or making any figure that fancy may dictate. A young actor in the part of the Doctor in *Cradle Song* recently held an audience breathless simply by making an exit. The Doctor's character, his complete personality, his surcharged emotions which he could not express in words, spoke out more potently than any speech in every footfall, every inch of his progress toward the door. It was not what he did, but the way he did it. Indeed he did nothing but walk to the door, turn and briefly glance back, and then go out. His back was to the audience for all but a brief instant of this entire business, but his audience night after night sat spellbound. And was it any wonder that they did? There was life, reality, power, pulsating human emotions carefully selected and intelligently combined to produce an emotional and artistic effect. Executed with finish and style as it was, it could not fail in its effect. Every habitual theatre-goer has seen similar exits. He has seen great actors hold audiences by the power and beauty of such a simple thing as a walk across the stage. Such a walk is not just a crossing of the stage. It is the outward and objectified presentation of the grandeur, the majesty, the pathos, the comicality of the inmost nature of a human being. The kitchen scene in *Twelfth Night* affords the actor playing Sir Toby Belch such a cross. Malvolio, Olivia's Puritanical steward, has just interrupted the revelry of the jolly drunken crew. In the old business of the play he enters in the progress of a song in which the revelers catch hands and dance around in a circle. For a moment he stands amazed, and then suddenly he finds himself, to his great consternation, enclosed in the midst of the jolly singing circle. As they dance around him, he tries to speak, but their clamor prevents him. At last he breaks through the circle and it breaks up, the actors variously placing themselves. Malvolio is directly facing Sir Toby across the stage as he delivers his haughty and stinging remonstrance, beginning "My masters, are you mad, or what are you?" As he warms to his remonstrance, the audience can see the fat, humorous, practical jokester, Sir Toby, growing more and more resentful. At last he can stand no more. And then comes that masterful, insolent, swaggering, bullying cross as he moves to Malvolio, saying "Why, what are ye? Art any more than a steward? Dost thou think because thou art virtuous there shall be no more cakes and ale?" These examples illustrate significant action, action that has a meaning, an idea to convey to the audience, action that carries over the burden of emotion or humor behind the lines, action that reveals the thought, feeling, and nature of the character enacting it. To be significant action must be clear, motivated, and harmonious.

23. *Symbolic Business*

From the descriptions of action that have been given, especially of that in *Cradle Song,* it is apparent that it may be of a dual nature. It may be literal and symbolic. The Doctor's cross to the door was a literal means of exit, but the actor playing the part made it symbolic of his character, the mood of the scene, and the emotions of the play. It cannot be said that every piece of action in a play partakes of this dual nature, but it can be said that when a piece of action does display it, as in the vase-breaking scene of *Fixins,* it becomes really significant action. The director must examine the stage business introduced by the author and by himself for the possible symbolic meaning of the action, and when it is apparent, rehearse it not only for its literal reason but also for its symbolic. For example, a quarrel between two men may often be more effectively staged if a table or other object is placed between them as a symbol of their separation. To illustrate further, a table between two estranged lovers may be an object about which symbolic action can be grouped. The estrangement is healed, the lovers come together with the table no longer physically separating them. Perhaps it is the man who must make the compromises, while the woman stubbornly refuses to give an inch. Perhaps both compromise and meet each other half way. In any case the action accompanying the scene can be made symbolically expressive. The way in which the characters are divided and grouped may aid in conveying the division in the conflict. These are examples of simple and elementary symbolism in action, but much more complex and intricate meanings may be conveyed. The director must, however, guard against too complex or nebulous symbols in the action. When he attempts either, he usually succeeds in making the action unintelligible and puzzling. Simplicity is a virtue in this as in other phases of art in the theatre.

24. *Business Must be Designed*

From what has thus far been said it has become apparent that a piece of business to be interesting and expressive must be carefully thought out and planned with four major considerations in mind, clearness, motivation, harmony, and significance. In this sense it must be designed. In yet another sense it must be designed. When a piece of business involves a grouping on the stage, that is when it involves an arrangement of several actors in relation to other objects on the stage and within a given space, its ability to excite interest and produce an effect is in part dependent upon its pictorial qualities. It is largely, therefore, in stage business involving more than one actor that this second meaning of this fifth requirement operates. A full consideration of it demands some discussion of the laws of design in relation to the composition of stage pictures.

(2) Principles of Design in the Composition of Business

25. *The Stage Picture*

Every major grouping on the stage, if it is to be beautiful and effective, must be considered as a stage picture, which in its composition like a picture on canvas is amenable to and governed by the laws of design. Each grouping, therefore, must be planned in each of its details and in the homogeneous combination of its parts according to a regular systematic method. The composition of a grouping on the stage differs, however, from a design expressed on canvas, because of the difference in the three dimensional and the two dimensional mediums, because of the difference in the elements employed in the composition, and because a composition on the stage is not a static but a fluid, living, moving, ever-changing expression. Like the forms of wind-driven white clouds, the stage grouping is sailing on with the movement of the action, dissolving its form into the new form that the action is constantly making to express itself. In its brief moment of existence, each grouping, each stage picture adds its contribution to the whole, produces its effect, and resolves itself into another grouping similar in purpose. Each is a design in itself and at the same time a part in a larger design. As a separate design the purpose, aim, or objective of each grouping must be clear, in harmony with and contributory to the whole play. While each grouping or stage picture has a unity, or specific meaning of its own, it is subordinate to the unity of the whole composition—the unity of the *inscenierung*.

The greatest aid to any director in his search for information on grouping is to be found in a study of the masterpieces of painting. Every artist in painting his picture has had to master the problem of grouping in his composition, and a study of how the great artists have done this will help the director in solving his problems. How such a study aids the director will be illustrated below in an examination of a well-known masterpiece. The director will supplement his study of masterpieces with the reading of works on the principles of æsthetics, on the laws and problems of design, and on the understanding and appreciation of art, especially painting. Works on choregraphy and the dance are decidedly helpful also, and it goes without saying that no mature director should be without some knowledge and appreciation of music.

26. *The Art of Design*

Both the stage picture and the painting on canvas are alike in that each is aimed to convey a definite idea or create an effect upon the spectator. The painting on a flat two dimensional surface must employ perspective in a way not required in the stage picture, which because of its three dimensional form has that quality inherent. Each of these pictures, however, must be composed in accordance with the laws of design, if it is to achieve its end. The art of design is the process of arranging forms and colors within a given space, according to a plan or method, to accomplish an objective. In a painting the given space is determined by the size and shape of the canvas. On the stage it is determined by the acting area used, which may be the whole stage or one single area. The forms in the painted picture are simulated by means of perspective, while on the stage they are actual three dimensional forms. From the designer's point of view, each is composed of mass, line, and color—the three elements which he must arrange according to a well-ordered plan.

27. *Unity in Stage Composition*

The major determining factor in the conception of a design is the immediate purpose or objective toward which it is aimed. The ultimate objective, it may be repeated, is to make the picture (stage business) interesting and expressive. Having determined the immediate purpose of the composition—the mood or emotion it is to convey, the story it is to tell, the character it is to reveal—the designer proceeds to invent the plan or method of composition which will most effectively achieve this in harmony with the ultimate objective. In the stage picture designed to tell a story by means of actors in a group (the forms), as in a painting employing figures of people, the immediate purpose will center in one or several chief figures upon whom the attention of the spectator is to be focused. The arrangement of the other figures in the composition will be so distributed and placed as properly to direct and focus the attention upon the center of interest or focal point. This has been discussed in more detail in connection with pointing (see Sect. 19). By this means the unity of the composition is attained and its meaning made clear. In a painting, which is static, unity once achieved in the arrangement is permanent. The stage picture differs, as has been noted, in that it is a living, moving, constantly changing arrangement. While a picture on the stage has its center of interest and thereby gains a unity of its own, the fact must not be lost sight of that it does not exist for itself, but only as a contribution to a larger whole. Its unity, its oneness, is not an end in itself. A play is not merely a pretty stage picture or a series of separate pictures. Having established the subordinate nature of the stage picture in the whole action of the play, the other principles of design in the composition of each picture may be outlined.

28. *Balance*

Every stage composition to be pleasing, effective, and clear, must be properly balanced. Balance has been defined as the arrangement of parts so that they weigh equally against each other (see Chap. III, Sect. 19). In the grouping of parts in a picture, balance requires a similar or proportionate distribution of these parts (mass, line, and color) on either side of the focal point or center of interest. The simplest form of balance in a picture would be that in which the focal point was in the exact center of space (frame or acting area) and a similar number and value of parts were distributed equally on each side. This simple form of perfect balance may be symbolically illustrated by the balance scale employed in science laboratories. The focal center of many paintings and some stage pictures is frequently in the exact center, but the exact balancing of parts on either side would be too monotonous for most of these compositions. This method is used effectively in sculpture and architecture, where large masses are involved. In the Lincoln Memorial in Washington the focal center is the figure of Lincoln seated in the center of the composition. If a line were drawn vertically through the center of the monument, the two halves would be observed to be exactly balanced by duplication. Since in a painting or stage picture this method of arrangement by repetition may lack the variety necessary to render it pleasing and effective, the designer secures balance by means of proportionate distribution. Instead of exact symmetry, he employs a more complex form of symmetrical arrangement, which includes proportion and distribution in a freer balancing of parts. Balance does not require that identical parts weigh against each other, but that parts which may be dissimilar weigh equally against each other. A single vivid color in a single costume may balance a large amount of dull hue in several others. A small group of forceful, active characters may balance a large number of inert and quiescent ones, just as in the balance scale the small mass of a pound of metal may balance the larger mass of a pound of cotton. The painter may center his attention primarily on the balancing of mass, line, and color, but to these the director must add the more significant and complicating factor of the importance and value of the characters, as established in the action of the play.

The exigencies of the stage business may not always permit the invariable placing of the leading character or characters (focal point) in the center of the grouping. This may be illustrated in paintings also. In such compositions the center of attention is removed from the exact center of the picture to one side and is balanced on the opposite side with a proportionate mass and color. In paintings of this nature the central figure or mass may be made to attract attention by the employment of vivid color as well as position, and is balanced on the opposite side by a large mass of color less vivid in hue. The preceding method of center balance was illustrated by the balance scale in which the beam is suspended in the center. This method of off-center balance may be illustrated by the steelyard scale, in which the suspension is nearer one end of the beam than the other, thus giving it a short and a long arm. A small weight hung on the short arm will balance a large weight hung on the end of the long arm. This method may be illustrated in the stage grouping of the scene in *An Enemy of the People* in which Dr. Stockman faces and harangues the mob. The force of the Doctor's character and his importance in the play make him a proportionate balance for the mob in the composition of the grouping. In this scene the director's chief problem in composition lies in the arrangement of the characters in the mob.

Painters may employ a third method of securing balance, which is also frequently useful on the stage. This is the balance of line in the composition. In intricate and complicated groupings this method is frequently the one employed by the painter to present a pleasing arrangement, although he may employ in conjunction with it one of the other methods. On the stage it is seen in its simplest form in the line-up of the chorus in musical comedies. The chorus is frequently arranged in double lines parallel to each other across the stage, one line balancing the other. Within each line there is often a careful arrangement to balance the line itself. Such a line-up would seldom be employed in the staging of plays; if introduced into the business of most plays, in fact, it would be decidedly bad, because of its artificiality and lack of variety. For the same reasons all straight lines and line-ups in the form of a semicircle across the stage are to be avoided in the planning and execution of most business in legitimate drama. The balance of line is, however, serviceable and acceptable in groupings composed of crowds and mobs. In these the arrangement of position, posture and gesture may be so planned on the basis of line balance as to be very effective. Reinhardt has studied and employed this method with excellent effect. In the same way the mob in *An Enemy of the People* could be rendered effective by the utilization of freely balanced lines in its arrangement. Its effectiveness could be enhanced at the climax by having each of the actors in it extend his arm high above his head with clinched fist shaken at Dr. Stockman. By the proper variation of the lines of these extended arms, the gesture could be made to seem spontaneous and natural.

Before proceeding further with the problem of adapting balance to the arrangement of groupings on the stage, it may be well to summarize what has been said about balance up to this point. Balance, to rely upon the *New English Dictionary*, "is the general harmony between the parts of anything, springing from the observation of just proportion and relation." It was in this sense that Ruskin used it in *Modern Painters* when he said, "In all perfectly beautiful objects, there is found the opposition of one part to another, and a reciprocal balance." The securing of balance requires a consideration of mass, line and color. Balance in a composition may be attained with an arrangement of parts about a focal point in the center of the composition, or of parts in relation to a focal point removed from the center, or by a symmetrical or free balancing of line against line.

29. *The Triangle*

Balance is secured by arranging the parts of a composition according to an orderly method or plan. Frequently in design the plan is based upon some geometrical figure, such as the square, the circle, or the triangle. The composition of many paintings is arranged on the basis of the triangle, particularly if they are to convey the illusion of three dimensions. The three dimensional nature of the stage along with the necessity for the audience to be able to see and hear make the triangle the major basis of arranging groups in plays. Its suitableness is readily apparent. In its simplest form it may be applied to a grouping of three figures on a full stage. The actor (*A*) who has the scene (who is the focal point) may play from stage center, facing front. The other two actors (*B* and *C*) play down stage right and left, each partly facing (pointing) the actor (*A*) at the apex of the resulting equilateral or isosceles triangle. In this arrangement no actor is covered, attention is properly directed, and the grouping is balanced. The triangle is suitable also because it allows for wide variation in its use. Suppose that in the previous grouping during the progress of the scene and the flow of the action the actor (*B*) down stage right became the center of interest. The triangle can be readily changed to indicate this by changing the pointing of *A* and *C*. The apex of the new triangle is then down stage right. If this grouping continues for long, however, the positions will have to be rearranged to prevent *A* from up-staging *B*. This may easily be accomplished by sending *B* up stage toward the center and bringing *A* down. (This involves a consideration of crossing and up-stage position, which will be discussed in the next part of this chapter.) The triangle is equally applicable to the arrangement of groupings involving a full stage or a single acting area on the stage, such as a grouping around a fireplace or table. The mob in *An Enemy of the People* might easily and effectively be arranged according to this form with Dr. Stockman at its apex up stage left. The resulting right-angled or obtuse-angled triangle would have its long side extending in a line from the Doctor's up-stage left position to the extreme down-stage right position, the other two sides extending in part along the right and rear walls. In such an arrangement Stockman would probably have to be placed upon an elevation (a platform) to prevent his being partly covered. The double triangles that result when a crowd on the stage separates down the center leaving a doorway revealed in the rear make an excellent grouping for a grand and impressive entrance. With ingenuity and careful planning the triangle arrangement may be variously adapted to the successful solving of the grouping problems.

30. *Variety*

By no means is there meant to convey in this discussion the idea that grouping on the stage or in painting is merely an arrangement of simple geometrical patterns. Such arrangements, especially if allowed to become static in a piece of business, would prove uninteresting and fatiguing on the stage, even if the movement of the action were to permit their use. Not only must a grouping on the stage have variety in the arrangement of its parts, but interesting variety must also be employed in planning the separate groupings. Repetitions in the arrangement of actors if over-indulged may become as ludicrous or boring as would repetition of a piece of business in succession by several actors. If variety is the spice of life, it is the very salt of stage life.

31. *Harmony in Design*

But in securing variety the unity of the action and effect must be preserved. This requires that any variation introduced either in the plan of the various groups or in the arrangement of the parts of the groups must be in harmony with the whole play and the specific grouping. The other requirements of harmony in stage business have of necessity been discussed in connection with the characteristics of stage business and unity in the grouping.

32. *Movement in the Grouping*

The necessity for movement in the stage grouping and the way in which movement differentiates it from a painting have been mentioned. The very nature of a stage grouping as a part of a developing story gives it the movement denied the representation of inanimate figures upon canvas. But the painter gains the effect of action and movement in his picture chiefly by the arrangement of the posture and gesture of the figures. While these naturally accompany the action in the stage picture they are no less important. Groupings involving any kind of violent action demand special attention to the posture and gesture of each actor. In groupings revealing repose and quiet such attention is just as requisite.

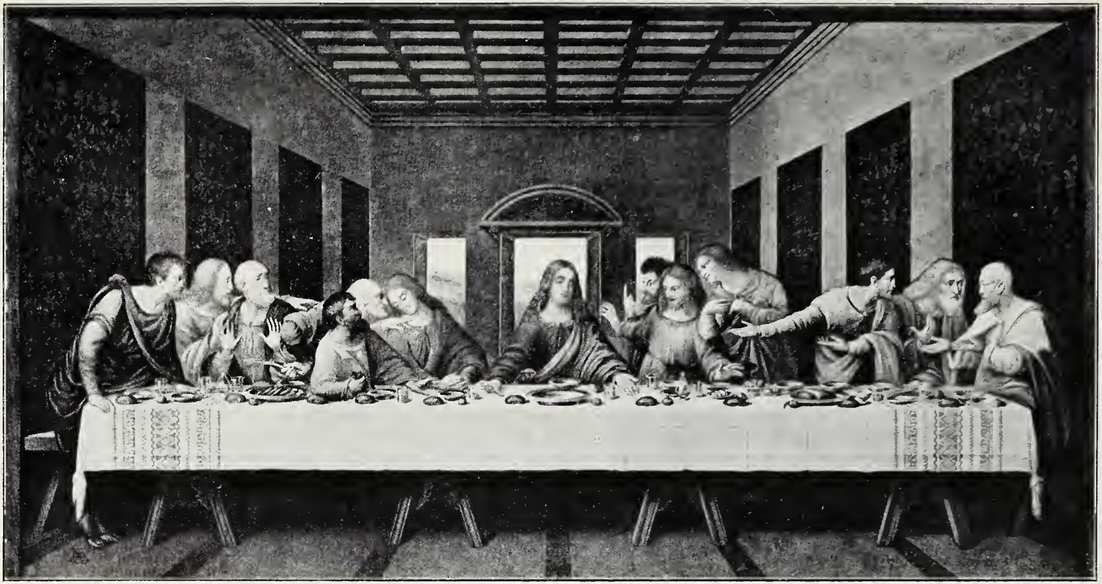
The presence of movement in the stage groupings as they form with the flow of the action makes necessary several considerations of a practical nature. Actors in playing their rôles are required to move about, thus forming new groupings. As they do this they are apt to cover or hide each other, thereby hindering the hearing and seeing of the audience. It has already been stated that when this occurs the actor must unostentatiously uncover. In the same way the movement within the grouping tends to destroy the balance of the composition. Against this the actors must constantly be on guard and ready, quietly, to correct it. Thus when actor *B* at the base of the triangle assumes the dominant part in the scene and moves up stage toward the apex of the triangle, actor *A* must counter or balance with a movement in the opposite direction, which will eventually give him a position relatively similar to that of *C's* at the base of the triangle. This movement must be made naturally and in keeping with the requirements of good stage business. The grouping in a play is in its continual flow with the action constantly requiring this adjustment in the position of the actors, and they must learn to make it almost automatically. It is these small but important elements in stage business that must be performed with precise care, if the whole action is to attain smoothness and finish. To attain this finish the movement in the grouping must be in harmony with the tempo and rhythm of the scene and characters. A scene of quiet and repose would be utterly spoiled by a hurried movement in each of its groupings, just as a scene of hurry and excitement would be rendered meaningless if its movement were slow, deliberate, and suggestive of repose. In the same way the movement must be executed in harmony with the rhythm of the characters. Mercutio's quick and agile movement transferred to Hamlet in the delivery of his third soliloquy would make the whole meaningless and laughable. This is but to repeat that the ultimate motivation of all business resides in character.

33. *Design Illustrated*

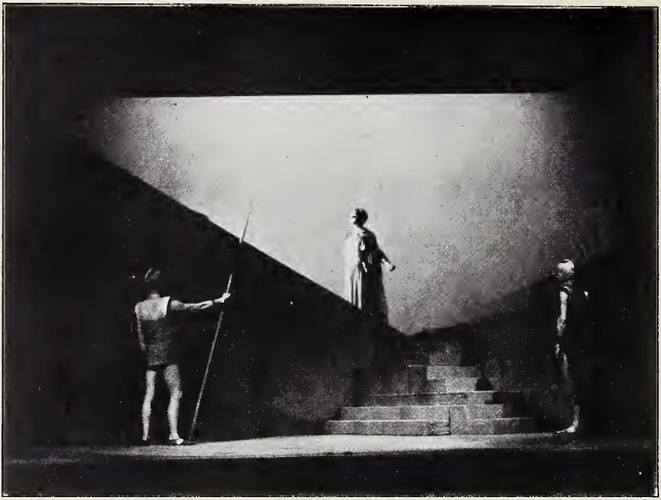
The essentials of a properly designed stage composition or grouping are, as has been seen, unity, balance, harmony, variety, movement. In its proper arrangement it must be worked out according to a plan or method. The most usual basis of design in stage grouping is the triangle. Before proceeding to the discussion of the practical aspects of placing business on the stage, what has been said about design may be further summarized by an examination of Leonardo da Vinci's great painting "The Last Supper." For a full appreciation of this picture it should be examined in a good reproduction, in which the intricate balance of color, and of light and shade may be studied.

The first thing that inevitably meets the eye in this picture is the focal point of interest, the figure of Christ. In it, to speak without irreverence, He has the scene. That was the intention of the artist. His whole idea hinges upon that one figure. He has completely unified his effect and properly coördinated the elements with that unified purpose. How did he do it? Some idea of this can be gained by an analysis. The figure of Christ, the focal point, is in the exact center. The two halves of the picture and the whole are symmetrically and proportionately balanced. The twelve Disciples are grouped six on each side. Each side in turn has two groupings of three figures each. The whole composition is built on the basis of the triangle with the central figure at the apex. Not only are the proportions exact, but there is also a perfect symmetry of line clearly discernible in the pose of the figures as well as in the gestures. The masses in the picture are as carefully balanced as the lines. The colors are no less equally well balanced. Even the massing and balancing of the food and dishes on the table have been carefully worked out. The exact way in which the whole grouping is balanced within the setting is no less well thought out and executed. The lines on the floor, the supports of the table, and the table drapery all make their contribution to the whole design.

But one of the most amazing things about this composition is its variety. Although there is an exact mathematical balancing of the figures in the two halves, there is no identical repetition in the grouping. The masses of each half are subtly proportioned, but they are completely different in the arrangement of the groups



"The Last Supper" by Leonardo da Vinci.



A scene from the première production of *More Sky* by Lynn Riggs, produced by the Northwestern University Theatre, Garrett Leverton, Director. The Production was directed by the Author and mounted by Lee Mitchell.

Note the use of the triangle in the setting and the grouping.

composing them. The posture and pose, the inclination of the head, the gesture of the hands, the expression of the face varies in each figure. With all this subtle variety in the positions of the figures, the faces are perfectly revealed. Study will reveal many more subtle aspects of balance and variety in this composition which space does not permit mention of here.

Two final aspects must be pointed out in the picture. The movement in the grouping is so excellently depicted that it seems more an enacted scene than a painting. The effective way in which the posture and gesture of each figure is executed makes every line point to the central figure, the chief center of interest. And even in this the subtle variety employed should not be overlooked. With such careful composition it is impossible to miss the center of interest or focal point in the work.

(3) PRACTICAL CONSIDERATIONS IN THE PLACING OF BUSINESS ON THE STAGE

In the discussion of the nature and function of business and of design in its composition, the consideration of certain practical aspects of execution could not be avoided. In the following study of business on the stage, therefore, there will of necessity be some repetition.

34. *Essentials for Conducting Business Rehearsals*

For the conducting of the business and all subsequent rehearsals (except the reading rehearsals), the stage or a large rehearsal room is needed. On the floor should be marked out with chalk the floor-plan of the act to be rehearsed. This should be in exact dimensions with all entrances indicated. In a similar way the position and dimensions of all important pieces of furniture should be drawn within the set, or better still, the pieces or their substitutes may be placed in their correct positions. If this procedure is not followed, the director may find when he comes to place the action within the real setting that entrances and exits have been rehearsed to occur where no doors are provided, that crosses have been learned with too many or too few steps, and executed through tables, sofas, or other furniture—in short that the action has been planned and finished but will not fit into its environment. For the same reason, important hand properties or substitutes should be provided, so that business in which they play a part can be properly learned from the beginning. By these suggestions it is not meant to imply that actors cannot learn to act a part without the actual articles which will be used in performance. Mrs. Fiske is reported to have said that an actor who could not in rehearsals, while sitting on an upturned box, portray a king on his throne would never become a good actor. True as this may be, there is nothing to be accomplished in subjecting inexperienced or trained actors to extra hazard and hardship in mastering their parts, when they have so much to learn in a comparatively short time.

There is a further requirement for the proper rehearsals of business, that of memorizing the lines. Some directors require actors to "have lines" before the business rehearsals begin, for, as they say, an actor cannot fully concentrate upon the execution of a piece of business when he is devoting his attention to peering at the script for his lines. There is truth in this, but, on the other hand, lines and business should be learned together. The actor must "suit the action to the word and the word to the action" if either is to be convincing and effective. No matter how exactly and minutely each piece of business has been explained in the reading rehearsals (as each must be), an actor does not "get the feel of it" until he has walked through it and to a certain extent mastered its execution. Most directors, therefore, prefer to give the order "have lines" only after the cast has walked through the business and set it by repetition. During this procedure attention should be called to the necessity for studying lines and business together, and for the mastering of lines outside the rehearsal period.

35. *Procedure in Conducting Business Rehearsals*

The work of mastering and learning business should begin with a walking rehearsal of the act. After the director has explained the layout of the set chalked upon the floor and made any necessary additional comments on the business of the act, the plan and directions for which the actors have written in their scripts at the reading rehearsals, the actors then go upon the stage, real or improvised, and begin to walk through the business as they read the lines. Some attention to characterization and to the meaning and delivery of the lines may be necessary in these rehearsals, but the major attention is to be centered upon the execution of the business. In the walking rehearsals the actors learn where and how they enter, how they move from place to place as the business may require, where and how they stand and sit, and where and how they make their exits. In other words, the emphasis in the walking rehearsals is upon the requisite business, with only the incidental attention upon the supplementary business that time may allow at this point. As soon as this requisite business has been blocked out and established by walking through it, it should then be repeated as often as necessary to set it.

When the requisite business is set and the actors have "the feel" of it, lines should be memorized for the other business rehearsals of the act. These rehearsals are devoted to the addition and mastery of the supplementary business and to polishing the execution of all business. The business and the lines must be harmonized. Attention must be given to executing business in character and making it expressive of character. The exact measurement of the business must be made; that is, the approximate number of steps in a cross or an entrance must be learned and made to fit the line that accompanies them. Large and complicated pieces of business must be broken into parts, learned step by step, put together into a whole, and the execution made almost automatic, and absolutely smooth. Actors must be taught to balance, uncover, and point in group scenes; and to coöperate in the execution of all business, not only in what they do, but also in reaction to what others do and say. This attention and reaction, which will be further noticed later, form the very core of acting. Reaction may be shown in facial expression, gesture, business, speech, or in all these. Facial expression, gesture, and business employed in registering reaction should slightly precede speech, as they do in life. That is, the actor must "register" first, and then speak. From the end of the walking rehearsals to the dress rehearsals the director must insist upon every actor in every part registering during every moment he is in the scene. Further discussion of this cardinal necessity in acting involves characterization and speaking of lines, which will be considered with the next group of rehearsals.

It is obvious that all that has been here indicated cannot be accomplished in the four rehearsals allotted to the business of the first act. A large part of it will have to be mastered in the drill periods, and the finer elements of finish and form will have to be added in the coördinating and orchestrating rehearsals. Each separate piece of business as well as separate scenes offering difficulties should be drilled step by step in the drill periods, until their execution moves like clockwork. In these drill periods as well as in the business rehearsals the director is a teacher and a drill-master, and his success will depend in large part upon his ability to teach and to drill and drill and drill.

36. *Pantomime Rehearsals*

When the individual units have been mastered and some continuity in the business of the act has been attained, the director will find it of advantage to hold one or two pantomime rehearsals, in which the actors go through the whole act in pantomime only. As the prompter reads the lines or as the actors repeat them in a whisper, they execute the business of the play, beginning with the entrance of the first actor and going through every detail to the curtain. At first inexperienced actors may feel some self-consciousness in doing this, but there is no better way of revealing pantomimic deficiency in an actor or of exposing the weaknesses of a piece of business. After continuous rehearsals, in which the director must watch so many different elements and details, he begins to lose perspective on the whole. These pantomime rehearsals are an excellent device for restoring that perspective, as well as for checking on details. They are of great service in building the continuity and development of the action in an act or in a whole play, and in giving freshness and life to the execution. Every piece of business should be performed as though it were the spontaneous and natural reaction of the moment, and as though it were the first time it had ever been done. In allowing the director to concentrate his attention upon business alone, these pantomime rehearsals aid in accomplishing these essentials of execution. The utilization of these, however, will depend upon whether the director decides they are necessary and upon whether time permits.

37. *Suggestions for the Execution of Business*

Leaving further methods of procedure to the ingenuity of the director, the discussion of business may conclude with some specific suggestions for the execution of certain forms of business. In the division of business into types, it was found that the simplest forms included that executed by a single actor, and the more complex forms that involving several actors and, consequently, the problems of grouping. Individual business includes in the broadest sense gestures, entrances, exits, crosses, standing, sitting, and rising, as well as many other actions. It is usually executed upon a stage occupied by other characters, however, and thus tends to become a part of group business. For the sake of clearness it may be permissible to discuss first those pieces of business that may be executed by a single individual, although these may not be entirely separated from group action.

38. *Entrances*

There is an old half-truth that says first appearances are lasting. Certainly they often are on the stage. Any entrance, and especially a first entrance, of an actor is a significant element in the establishment of his character. It should be carefully planned, and executed with finish. The author of the play has given careful attention to it, for he realizes the importance of properly introducing his characters. Instances of this attention are apparent in every good play. The famous example of Molière's introduction of Tartuffe is well known. The covered introduction of Cyrano de

Bergerac is perhaps equally well known. But what avails all the author's careful preparation if the actor in the rôle makes a weak and ineffectual entrance? The entrance should be so devised as to set the key of the character. Not only must it be made in character, but the character should be assumed before the entrance is made. Nothing gives a more amateurish and unfinished appearance than an actor entering out of character and then assuming the character before the audience as he speaks. The old advice—assume your character two minutes before you enter and ten steps off stage—is good. Entrances must also be perfectly timed and executed according to cue. If the entrance is from either side of the stage, the actor should enter with the up-stage foot forward. In this way he enters facing the audience. For the same reason he should close doors with the down-stage hand. When two characters enter together and one is speaking, the one speaking should enter last. Lines spoken off stage prior to the entrance of a character, such as those spoken by Torvald Helmer preceding his first entrance in Act I of *A Doll's House*, create a splendid impetus for the entrance. Similarly, off-stage noises, such as knocks at the door, center the audience's attention on an entrance and can at the same time be made excellent vehicles of character revelation. The effectiveness of a cautious opening of the door and furtive peep inside the room before a character's entrance can easily be realized.

39. *Exits*

Exits are no less effective when properly planned and skillfully executed. They, too, must be made expressive of character and productive of the effect aimed at. Exits must be so executed as not to delay the continuance of the action on stage. The accomplishment of this involves chiefly the cross preceding the exit.

40. *Crosses*

Entrances and exits involve crosses. All crosses should be made by an actor on his lines because, since the eye tends naturally to follow a moving object, attention would be distracted from another's speech if the cross were made while it was in progress. The moving actor in that instance would be "hogging the stage," and depriving the scene and the actor who was speaking of proper and rightful attention. One of the first things, then, which an actor must learn is to stand still when not required to speak or move. This is a more difficult accomplishment than it may seem. Few inexperienced actors know how to do it naturally and remain perfectly in character at the same time. In planning exits the director should so arrange the cross preceding the exit that the actor can execute it on his own lines. It can be readily seen that an actor playing down stage right or center, who must make an exit through the rear left door, will, if he delivers his entire line in the down-stage position and then turns and walks the length of the stage to his exit, create a very noticeable pause in the action. Even though the cross involves only a few steps, it should be made on the actor's own lines. This may require careful adjustment of the business, but if neglected the action will lack smoothness and movement. There are instances of course, when the demands of the action require a violation of this principle. The director of the old nineteenth century melodrama who has the villain deliver his nefarious ultimatum from down stage center and then turn and insolently and coolly stride to the door amidst the consternation of his victims, is building an exit on the reverse of the usual practice for specific reasons. In the melodrama this exit is effective and highly successful, because it is deliberately and intelligently planned to secure the effect which it produced. That is the secret of a good cross or exit. But in the execution of this particular exit, as in that of most crosses, entrances, and exits, more than the action of the individual actor is involved. The villain's exit must in great part be built, supported, and held for him by his fellow actors. As in all group acting, one minor actor who refuses or fails to coöperate will spoil the effectiveness of the whole.

On the stage, as in geometry, the shortest distance between two points is a straight line. An actor crossing the stage should move in a straight line, because that is the most economical method of execution, and because it aids in giving finish to the business. The raggedness and ineffectualness of a cross from one side of the stage to another made by circling around a piece of furniture is too frequently apparent in nonprofessional performances. If an actor is impeded in his cross by a stationary object, the cross should be broken into two movements, each consisting of a straight line. Crosses should always be made in front of any stationary objects which may lie in the path of the action. The objective should be definitely known, the cross accurately timed, and the move made directly to the point without hesitation, without that indecisive and uncertain starting and stopping which gives the effect of crudeness and lack of finish. When several actors are moving back and forth on the stage at the same time in the ebb and flow of a piece of business, for the sake of variety and balance they should move in different directions. The old comic trick of one character pacing back and forth on the stage followed by another, secures its comedy in part from this moving of both characters in the same direction. For the proper execution of crosses the actor must be taught how to walk on the stage. Unless the interpretation of the character demands otherwise, he should stand erect, leaning slightly forward, so that the weight of his body is thrown on the balls of his feet. In this position he can readily shift his weight to either foot and step out in any direction with smoothness and ease. The director must drill every member of the cast in every important cross, and must insist that crosses always be made in character and in harmony with the rhythm of the character. This insistence is especially important with inexperienced actors who may regard a cross as merely a means of getting from one place to another and not see it as significant action.

When entrances, exits, or crosses are made by an actor upon a stage occupied by other actors, pieces of business which will occur constantly in the progress and flow of the scene, they affect the composition of the grouping and thus make necessary new alignments. Every time a cross is made on the stage, the director should check on the balance of the new arrangement, as well as teach the actors to become conscious of and execute any necessary balancing. Such new alignments are occasioned not only by the movement and flow of the scene accommodating itself to the action, but also by the introduction of a new character or the departure of a previously participating one. Either an entrance or an exit creates a new scene, which presents new psychological relationships in the situation and in the relations of the characters one with another. The new relationship finds expression in a new grouping. Exactly the same thing happens in life when a new individual enters a group engaged in conversation. Assume that the previous conversation has been gossip about the newcomer. The new trends the new combinations, the psychological and emotional adjustments necessitated in the group by the arrival of the subject of the conversation can readily be imagined. All these and more are expressed in the physical movement of those in the room. The major difference in this and a similar scene on the stage is that the stage scene has an audience viewing it, upon which it must produce an effect. When this factor is introduced, the laws of artistic composition should begin to operate. In not only a relatively dramatic scene, such as that just described, but in every scene the introduction of a new character means readjustment, emotional and physical. The skilled playwright is thoroughly cognizant of this and uses it subtly in every scene. He knows that the fundamental consideration for him in writing his play is the reaction of character to character, character to situation, and character to ideas. A group of characters on the stage should be a highly complex but unified composition of these reactions composed of the totality of all its separate and various parts. Take from that totality or add to it a single factor and you change not only its nature but also the direction of the reaction. Slight and subtle though this may be, it is unavoidable, for every human being differs essentially in his make-up from every other. Introduce this difference into the design of the composition, and, slight though it may be, you have changed the design. The director must be as fully aware of this and as sensitive to it as is the playwright.

Such being the case, every exit and every entrance must be taken into account in its effect on the balance of the stage picture. Attention has already been given the method of entrance and exit. At this point the chief concern is with the redistribution of the grouping. When a single actor enters a stage occupied by one actor, the problem of balance presents no great difficulty. Here the question is primarily one of variety in the grouping. An actor upon entering on to a stage occupied by two other actors may easily be grouped with these by the simple employment of the triangle. Let it be supposed that he enters from the rear and the two characters are standing near each other on stage left. If the entering character is to take the scene, it is a very simple matter to move one of the two actors toward the right of the stage and bring the entering character down stage to the apex of the resulting triangle. If one of the two characters is to continue in the dominant part, it is no less easy to send him up stage to meet the entering character, who is then crossing to a down-stage position. Perhaps the two characters may remain in their relative positions and the character entering, who now has the scene, stops directly in front of them but nearer the center of the stage. Here the apex of the triangle is toward stage right; if this scene is to continue for some time with this grouping, therefore, care must be taken to prevent the actor in the up-stage position on the right from upstaging the dominant character. Any number of variations for maintaining balance of a group upon the entrance of an actor from the rear or from either side may be worked out in similar fashion. An eye for balance and a little experimenting will solve the problem. It is made more complex and difficult, however, when several actors enter simultaneously, but the same triangular method of solution is applicable. A still further complication is introduced when these actors enter from several different points. The difficulties here are just as solvable by the application of intelligent effort critically directed.

41. *Sitting and Rising*

But to return to the business of individual actors. Some suggestions may be made concerning sitting and rising. The manner of their execution may be made revealing and expressive. The director will plan each significant instance of this business so that it may express precisely what is required, and then drill the actor in its accomplishment. In society plays he will probably have to teach each actor to sit and rise gracefully. We have grown careless in modern life of these amenities of polite and graceful social intercourse. We lounge about in our chairs in a way that would have horrified our grandparents. We drop down into them and jump up from them with a freedom that they would have condemned as unladylike and ungentlemanly. In many contemporary plays this manner may perhaps be justified as being in keeping with the play and the period, but it cannot be justified in certain modern high society comedies or in revivals of eighteenth or nineteenth century plays. Here again study and drill are requisite.

42. *Using Furniture in Acting*

The business of sitting and many other pieces of business require the use of furniture in their executing. A few suggestions concerning its use may logically be included at this point. An amateur performance in which some or all the actors from sheer embarrassment or lack of training are continually leaning on or hanging onto the furniture presents an extremely ludicrous effect. On the other hand, it is unnatural for all the actors noticeably to avoid using any pieces of furniture in their acting. The director and the actors are seeking in the production to create the illusion that the three visible walls and the chairs, tables, desks, and other furniture are actually a room in which and furnishings with which people live day by day. If I as a spectator am to believe that the people I see do actually live in this room with these objects, I must see them using them with a familiarity that comes with intimate association. Not only for the sake of this illusion of reality, but also because it will form a pleasing variation in the business and in the arrangement of the groupings, must the furniture on the stage be used. It is a pleasant relief to see an actor drop naturally into a chair after the preceding groupings have been composed too exclusively of actors standing. But by the same token, the repeated use of this device or the remaining of a character or characters too long in sitting or standing positions will become just as monotonous. Monotony also results when too many characters sit in the same way or utilize in turn the same piece of furniture. It becomes laughable if every character that enters goes in turn directly to the fireplace and one after another sits down in the same way in the same chair. The repetition of this business for comic effect is an old trick on the vaudeville stage. With ingenuity and study a variety of positions may be worked out with an actor, or two actors, and a chair or table. Each different combination of positions may be made to say a different thing. That is the director's object in designing and rehearsing any business, to make it talk.

43. *Group Business*

Group business is in the first place a combination of pieces of individual business, and as such, all that has been said of the one applies to the other. But group business is more than that. It is a complex, coöperative action requiring special consideration as a form.

The first consideration in the placing of group business on the stage is to determine who "has the scene" (the focal point), and how attention will be focused and maintained upon this focal point as the movement of the action progresses. It has been seen that in many pictures the center is the chief point of interest. In stage groupings involving the full stage the center of the stage is likewise the strategic position. Stage center refers to the area between the right and left boundaries of the set, but nearer the footlights than the back wall. The emphasis and advantage of this position, however, is subject to other conditions of the business. An actor moving, like any moving object, will divert attention from those not in motion. This, as has been shown, is why an actor must make important or necessary movements while he is speaking and has a right to the attention of the audience.

An up-stage actor in the grouping usually occupies a strategic position also. The actor who enters from the rear upon a stage where there are several actors attracts attention, not only because he is moving but also because he holds this up-stage position. In viewing a landscape the eye travels to the horizon and to all moving objects first. The eyes of the audience act in the same way. From the important positions they signify the terms "up-staging" and "being up stage" have come to be used as common synonyms for superiority. This position was even more important in the old days when the stages slanted toward the footlights, thereby making the terms up and down stage literal descriptions of position. Groupings must be carefully coördinated in their arrangement with the considerations of position, motion, the actor speaking, and sometimes the bright colors of costumes, in mind. In some instances the exigencies of the business may require actors of minor importance to play up stage. When this occurs, care must be taken to render them as little attention-compelling as possible by keeping them absolutely still and requiring them to focus attention upon (point) the actor or actors whose scene it is.

Of great assistance to the director in arranging groupings and giving emphasis to certain action is the employment of different levels on the stage. This is accomplished by means of steps, platforms, and ramps. These may enter even more largely into the staging of expressionistic and stylized than in naturalistic and realistic plays. With proper attention to the design of the setting, they may often be employed to advantage even in the most realistic play.

44. *Playing the Whole Stage*

In the planning of the business and in its execution the director must utilize the whole stage. By this it is not meant that every scene must occupy the whole stage, but that one acting area must not be repeatedly and monotonously used to the neglect of others, Every piece of business should not occur around a fireplace or table, every scene should not be staged on the same side of the stage. Nor should the action be cramped by the actors playing too close together or by business being crowded into an area too small for it. When dominant actors have important speeches, they should be required and taught how to "take stage." They should move out freely from the group and back to it as the progress of the speech or action determines and sways the movement. In training actors to do this properly, as in much of his work in rehearsals, the director must be a teacher of acting.

E. Characterization and Line Rehearsals

The mastery of character in acting goes hand in hand with the delivery of the lines, just as both are bound up inextricably with the business. Galsworthy in his analysis of the elements of drama, in his essay "Some Platitudes Concerning Drama," comes to the conclusion that "plot is character," and "dialogue is character." In other words, people act and speak as they do in any given situation because of what they are. Both the proper execution of the action and the speaking of the lines in a play, therefore, is dependent upon the conception and interpretation of the characters. Because of this organic interlinking of the parts, it has already been necessary for the director in conducting the business rehearsals to center some attention upon character, and also upon lines, at least to the extent of having them memorized. In this succeeding group of rehearsals, attention is to be centered chiefly upon the perfection of the characterization and the delivery of the lines. During the progress of these the business will not be dropped, but will attain more and more subtlety and finish, for character is revealed not only by what people say but also by what they do and how they express their ideas and thoughts.

Characterization is primarily the problem of the playwright and the actor, but in the interpretation of the play the director is the intermediary and arbiter between these two. With inexperienced actors he must teach the method of understanding and projecting what the author has written, and for experienced and inexperienced actors he must determine the nature or emphasis of their interpretations and the place and importance of their rôles in the design of the production as he has planned it. In the discussion that follows, there will be no detailed consideration of the problems of acting involved in the projection of characters, which have been ably treated by Samuel Selden in his *A Player's Handbook,* nor of the matter of training the actor's voice for the effective delivery of lines. What is said about each of these will be in the nature of general suggestions for the director in conducting rehearsals.

45. *Characterization*

By characterization is meant the art of the playwright and actor in delineating and projecting a detailed representation of a person. It is a portrayal of the characteristics which serve as an index to the essential or inner nature of a human being. Character is the sum of the qualities by which one individual is distinguished from another. It includes the mental and moral traits or qualities belonging to the individual, which are the product of nature, education, and habit. In drama in particular it includes the emotional endowment of the individual. The totality of all these the playwright writes into his rôles, and the actors project to the audience.

In the old days of type characterization and type acting, the rôles were divided into straight and character parts. A character part was any part that involved eccentricities and mannerisms in its composition and execution. There may be some usefulness in this division for the director today, but every rôle in a play should be considered as a character part in the sense that every person in the play is to be considered as an individual by the actor portraying the rôle. Even the smallest "walk on" (a part with no lines) can in this way be rendered effective and significant in its projection.

But in rehearsing the actors for characterization, the various rôles in the play must be properly coördinated. The leading characters must stand out in proportion to their significance and the minor rôles must be properly subordinated. The entire emphasis of a play may be changed by playing up one or a group of minor characters. This change has occurred in many productions of *Twelfth Night* by overemphasis on the minor characters in the subplot. Another division of the characters of many plays into sympathetic and antipathetic is useful to director and actors. By utilizing this division in the working out and execution of the rôles, the process of audience identification with and sympathetic response to character and situation, (called empathy by the psychologists), is effectively enhanced. The simplest form of the division into sympathetic and antipathetic characters occurs in melodrama, in which the conflict is definite and clear and the contrast between hero and villain well marked. But even in plays of excellent literary quality, in which the conflict is more subtle and the characterization more individualized and less rudimentary, this division may be usefully observed.

The process by which an actor masters a rôle is so highly imaginative and varies so definitely from individual to individual that no exact procedure can be stated, nor is such a statement necessary. Every person who has read novels or plays, or witnessed cinema or stage performances, has followed to some extent the process of imaginative creation of characters. The actor merely increases and sharpens his natural gifts of imaginative re-creation and imitation. He makes himself more highly susceptible to the explicit and implicit suggestions of character written by the playwright into the text of the play. In doing this he may be aided by an analysis of the methods or devices employed by the playwright to characterize the rôles. A knowledge of these methods is particularly useful to the director in his discussion and explanation of the rôles at the reading rehearsals. These may be summarized as follows: A character may be characterized by

a. What is said about him;
b. What he says and how he says it;
c. What he does and how he does it;
d. His ideas and beliefs;

e. His emotions and feelings;
f. His past, including his heredity;
g. His surroundings, including his environment and associates;
h. His appearance.

The actor's first conception of a rôle comes from his reading and study of the whole play. In the reading rehearsals the director presents in his analysis of each rôle the nature of the character interpretation to be projected. By doing this he is seeking not to impose his conception upon the actors, but to stimulate their imaginations, vivify their conceptions, and unify the combination of the rôles. With this accomplished, the process of projection through action and speech can proceed on a sound basis. Usually, it is advisable in the first steps of this projection to insist upon a bold and exaggerated type of characterization. In these first steps of interpreting the rôle, emphasis should be placed upon the appearance, posture, gesture, walk, and tone and pitch of the voice. Joseph Jefferson says that in working out the character of Rip Van Winkle he first dressed and made-up to look like his conception of Rip. Every individual has a definite rhythm, which may be similar to but is never exactly identical with the rhythm of another. For example, the rhythm of every Southerner may seem alike to one brought up in Maine, when he visits the South for the first time, but to Southerners the rhythm of each is marked and distinct. This rhythm of the character must dominate the whole projection of the rôle, the speech, walk, gesture, every movement. It is this that the actor must be directed to catch and set in his first bold characterization. After the general traits of character have been mastered, attention should be centered in rehearsal upon the refining and subtilizing of these traits, and upon the addition of small but effective strokes, which may include slight gestures, facial expression, the use of the eyes, the emphasis on words, and the tone and inflection of the voice. The major burden of this work of characterization should fall upon the actor, but the director will have to stimulate and guide him in it. The less-experienced actor especially will need help.

46. *The Delivery of the Lines*

The effective delivery of lines is an element in the projection of character which is in general dependent upon the conception of the rôle, and more specifically upon an understanding of the meaning of the lines, an appreciation of the emotion behind the lines, and the possession of a trained voice. Consideration of the latter requirement does not belong in this discussion, except in so far as the director as a teacher of acting must deal with the problem of voice training. To do this effectively he should have had training in speech and interpretation. Or he must have at least acquired a knowledge of breath control and cultivated a sensitiveness to the tone, pitch, and inflection of the voice. Of great aid toward this is training in vocal music. This training in vocal music is preferable to that of the artificial and unnatural systems of elocution encountered in some schools. Adequate training will enable the director to instruct the actors to make true and exact tones and sounds, to appreciate the sounds of each vowel alone and in combination, and the sound of each consonant. Both director and actors will profit by a knowledge of dialects. For those who have not access to a properly trained teacher, instruction from whom furnishes the only sure method of voice training, gramophone records of accurate speech and dialects will afford some instruction. One further admonition is not to be omitted: In every theatre, as constant guide and arbiter for actor and director, there should be an unabridged dictionary.

47. *Making the Lines Clear*

Making the lines clear to the audience involves two factors: understanding and delivery. The director's first duty in connection with lines is so to elucidate them to the actors that there is no chance for misunderstanding their meaning. But understanding involves more than the meaning; it involves an appreciation of, and, to some extent, an imaginative identification with the feeling and the emotion of the character, which impels him to act and speak as he does. Dialogue is character, says John Galsworthy. Whether an actor must completely feel with his character or whether he is emotionally cold varies with every individual; but the discussion of the question would be a mere exercise in psychological dialectics. This much may be said, however, that in the mastery of a rôle, some part of imaginative emotional identification is necessary, but in the projection of the rôle after it is mastered, the actor's reason should guide and control his performance. An actor must never forget his audience nor his fellow-actors, which condition would result if he lost himself completely in the emotions of the rôle. The best acting requires a keen observance of the audience-response and a subtle use of and adjustment to that response. In the preliminary study of the character the director can through suggestion aid the actor in his imaginative identification, and through careful attention to the speaking of the lines and enactment of the business, render him audience-conscious.

48. *Enunciation*

"Trippingly on the tongue" is the text of this section. One of the chief reasons why nonprofessional actors are not understood is because their words cannot be heard distinctly—it is not that they do not speak loudly enough, but that they run words together indiscriminately, without clearly enunciating any of them. Mrs. Fiske passed lightly over her less important words, but she never failed to enunciate precisely those which made her points. Sometimes in order to correct the fault of poor enunciation, it is necessary to require an actor in his drill periods to speak his lines over and over, patiently but painfully enunciating every single word, as if he were a beginner learning to speak a foreign language. The director may also have to strive to correct the unnaturalness and self-consciousness that often results from such an exercise.

49. *Pointing Lines*

Making the lines of a play clear to the audience involves pointing. Every line has a core of meaning, the key to which is expressed in a single word or group of words. If all the words of the line were delivered with equal value, the line would lose its meaning and be difficult to understand. If, on the other hand, most of the words were underemphasized but the important words stressed, it is not likely that the entire meaning would be lost. Mrs. Fiske could with admirable ability flit over the supporting words with amazing speed and then emphasize her points with such finish that the meaning of her lines was never lost. People who know what they want to say and feel what they are saying, naturally point their speech. On the stage, however, inexperienced actors must be carefully trained by the director to do this. Often it is necessary for him to pick out for the actor the points of various lines, underline these in the script, and require their delivery with special force and emphasis. Care must be taken in doing this with some actors to prevent an unnatural, self-conscious overemphasis of those underlined words.

50. *The Pause*

One of the reasons why the speaking of lines by amateur actors often seems so unnatural is because they are *recited* without pause in schoolboy fashion. The most powerful single factor in the delivery of lines, perhaps, is the pause. There is the pause significant, the pause emphatic, the pause hesitant, the pause bashful, the pause triumphant, the pause apologetic, the pause attributive, the pause vacant, the pause scornful, the pause submissive, the grand pause—with apologies to Sheridan the list might be extended further. The pause gains its meaning only when prepared for by words. Its use in rendering lines adds not only more power and effectiveness to them, but also the naturalness that comes from seeming to think and feel one's way through the conversation.

51. *Tempo and Rhythm*

It has been observed that every character has a peculiar rhythm, which in the projection of that character the actor must catch and fix. This rhythm comes out clearly in the delivery of lines. Students of languages discover that one of the great secrets of learning to speak a foreign language is to catch and imitate its rhythm.

Actors may apply the same procedure to the mastery of any character and especially to characters of a distinct locality. Some years ago a woman brought up in New York and Europe interpreted the speech and movement of a Carolina mountain woman so effectively that she deceived the natives in her acting. Her secret, after mastering the dialect, was to catch the rhythm peculiar to these people and then individualize it in the rôle. Rhythm in this sense means the "movement of the uttered words as marked by the succession and alternation of long and short, accented and unaccented syllables, and by the position of the pauses." As such, it is not only dependent upon the nature of the character, but also upon the emotion of the moment and the tempo of the scene. It is readily apparent how anger or excitement changes the rhythm of and is expressed by the tempo and rhythm of a speech. Shakespeare has splendidly illustrated this acceleration of tempo under excitement in Act I of *Hamlet,* in the scene following Horatio's revelation to Hamlet about the appearance of the ghost, in the dialogue in which Hamlet questions and Horatio answers. The click, click, click of the rhythm in this scene reveals Hamlet's excitement and pulls up the attention of the audience. It is not so much the tempo that catches attention, as the change in tempo from the former scene.

Tempo means "the degree of speed or slowness at which a piece or passage moves; the rate of speaking." In its connection with the whole play tempo and rhythm are to be further discussed in the section on the finishing of the production, which follows. Here one further observation must be made upon them in connection with lines. The tempo and rhythm of a line must correspond in delivery to the business that accompanies it. A cross, for instance, must be measured and timed so that the execution of the business harmonizes with the lines. It is the lack of harmony between action and speech that often causes the inexperienced actor to appear out of character. If the rhythm of the character is thoroughly established, however, it is apt to dominate the whole projection without much conscious effort on the part of the actor or director. This fact must not be made into an excuse for the director's neglecting to give attention to and drill the actors on these points.

52. *Taking Cues*

The tempo of a scene is not only dependent upon each actor's rate of delivery, but often more largely upon the proper taking of cues. One of the besetting sins of the untrained actor is his failure to pick up cues. He waits until the actor playing opposite him has entirely finished speaking before he begins. When that happens, the dialogue proceeds in a series of jerks like an old balky model T Ford that has magneto trouble and water in the gasoline. This practice is not only harmful to the characterization, but absolutely disastrous to the rhythm of the play. Attention and drill will eradicate it. The actor about to speak must not wait until his opposite has concluded and the sound of his voice has ceased; he must begin speaking when the opposite is enunciating his last few words. Concerning the speaking of lines, then, it may be said that they do not tie together end to beginning, but rather that the beginning of the next speech ties into the last three or four words of the speech preceding it. After the lines are memorized, this habit of snapping cues must be drilled into the cast. One of the best methods is to assemble the cast around a table and hold a simple line rehearsal, in which every character is required to remain in character so far as his speaking is concerned, and to snap his cues with alacrity.

Another fault to which the inexperienced actor is prone, almost as bad as that of dragging cues, is the dropping of endings. As he nears the end of his line he tends to drop his voice so that it gives the effect of fading away into inaudibility. The director must be on the watch for this and drill the actor in the method of finishing his line strongly and crisply. He must bite off the ends of his lines and not drag them out.

53. *Topping*

The proper method of taking cues should be mastered. The tendency of the untrained actor is to begin his speech in the same tone in which the preceding speech ended. He tends to pick up the tone of the actor playing opposite him. This makes for monotony, and is not to be allowed. In a climactic scene of consecutive lines uninterrupted by much business, the practice of topping will aid in overcoming this fault and in building a climax. That is, the actor in beginning a speech in such a scene must top the conclusion of the speech just finished. His tone must be pitched differently and his force must be a trifle stronger than that of the actor who has just finished. This gives to a scene an effect of building, which is absolutely essential. The effect is to be readily observed in a real scene from life, in which two angry people cut and thrust at each other with words. In that instance, however, the practice leads to shouting. This is avoided on the stage by the subtle variations of tone and force within the speech itself and by the skillful balancing of scenes of rising intensity with those of a quieter and calmer nature.

54. *Action and Reaction*

Some of these faults in the delivery of dialogue arise from a misconception of its nature. It is too often thought of as consisting of speeches to be spoken, when it is by no means that. Such a conception leads to the attitude and practice that may best be described as the "I speak my speech, now you speak your speech, now you have spoken your speech, and I will speak my speech" manner. This might well be called the old-fashioned commencement program manner. It is absolutely fatal to drama. Too many people trained in what is called interpretation today, but was some years ago called elocution, have this manner when they attempt to act. Dramatic dialogue rightly viewed is not a series of speeches to be spoken by reciters. It is conversation in which individuals say what they say because they are what they are and because they are in the situation or entanglement of that moment. What they say is not a harangue to an audience. So far as they are concerned as characters in a play (but not as actors), there is no audience. The words of one character make another angry, or happy, or puzzled, or sorry, and he replies as he does. If you watch the angered one closely, you see his expression change, his body stiffen, his hands move perhaps, and then the words come. Always this action, or rather reaction, will precede his words, unless he deliberately conceals it. But that, too, would be apparent. He is not then saying speeches, he is living, and words are called from him by situations in which he finds himself, and by his thoughts and feelings. It is thus that lines must be spoken upon the stage. The actor is not merely acting; he is living the character; he is the character. But the actor is after all playing for an audience, and he and the director must see that his acting carries over to and produces the desired effect upon that audience. In living the character before the audience the actor must so select, combine, and execute, as to produce a work of art. Like all art, this requires technique, a knowledge of how to handle the medium.

55. *Line Rehearsals*

Just as pantomime rehearsals are found to be of value in perfecting the business, so will line rehearsals prove equally useful for the mastering of lines, the picking up of cues, and the setting of the tempo of scenes and acts. For these rehearsals, it is better for the director to seat the actors, omitting the performance of the business in all but imagination in order to allow them to concentrate more largely upon the problems of delivering lines. By this concentration, finish in the rendering of meaning, fidelity to the wording of the script, and promptness and snap in the taking of cues are achieved. Beginning with the first line of the act or scene, the whole should be run through in consecutive order. Such rehearsals are valuable for the setting of the lines and of their order during the first periods of committing them to memory. It should be insisted again, however, that memorizing the lines is the actor's task, to be accomplished by his private study and not in rehearsal periods, in which the time of the whole cast should not be wasted by one individual.

56. *Rehearsing the Other Acts*

A glance at the rehearsal schedule at the beginning of the chapter, will show that the second act of the play has been put in rehearsal before the characterization and line rehearsals of the first act have begun, and the third act before the second is rehearsed for these elements. By this means the actors have become familiar with their lines and parts in these acts before they are called for business rehearsals. With study they should be able to commit to memory the lines of these acts rapidly. It may not be amiss to repeat here the warning that neither the first nor second acts are to be perfected completely before the second or third acts are attempted; that is, the business of an act is not to be finally and completely finished in its execution before passing on to the rehearsals of the other elements. The final finishing of all these will come in the orchestrating and finishing rehearsals when the whole play is coördinated.

F. The Finishing Rehearsals

With the business of each scene and act learned, the characters mastered, and the delivery of the lines perfected, the next step in the process of production is to fit all these together and place them properly within the setting. From this point on, the director's concern is with the whole play. The coördinating and orchestrating rehearsals are, therefore, considered here as a single unit. Before a production can be finished, its parts must be coördinated. To this end the first three of the finishing rehearsals are devoted.

57. *Coördination*

Although the director has kept the whole play in mind in rehearsing the various elements, he has up to and through the twentieth rehearsal (according to the schedule outlined in the beginning of this chapter) and in all the drill periods been primarily concerned with individual units large and small. Just as he fitted these together to make a complete performance of an act, now he must fit them all together to make a whole play. Those units properly designed in themselves and mastered must now be fitted into coherent acts and into a whole play. Specific parts of the action, such as songs, dances, duels, mob scenes and mass actions, which have been rehearsed and perfected separately, must now be fitted into their scenes and coördinated with the whole. In the same way, off stage business or effects, such as shouting, bells ringing, motor cars starting or stopping, sunrise and sunset, are now introduced as they are to be performed, and fitted into the scenes in which they occur. In these rehearsals actors learn to handle properties with deftness and finish. The opening of letters, the handling of gloves and bags, serving, drinking and eating, must be harmonized with the lines that accompany them. To this end the complete setting is now necessary. That means that the crew rehearsals should have been completed. If the actual settings—scenery, lighting, costumes, properties—are to be ready, they must be planned and executed from the beginning according to schedule. Unfortunately, for the finish of the performance, in many little theatres these are often not ready before the final dress rehearsal. When it is impossible to have the complete setting for these rehearsals, the director will have to do the best he can with substitutes. The identical cups and saucers to be used in the final performance are not essential for the integration of the tea-serving scene, if some cups and saucers are provided. Sticks may be used instead of rapiers for the fencing scene, but the actors will not become expert fencers by the use of sticks. No football coach would think of drilling his team up to a day or so before a game without a football, or even with a basketball as a substitute; yet many so-called directors think it fully satisfactory to neglect all the elements of the setting until the dress rehearsals. Many of these elements were necessary for the proper rehearsal of the business; now they are essential for the proper coördination of that business and for the perfecting of the actors in their use. If an actress must in a piece of business throw herself against a door, it is rather hard to coördinate and perfect that action if there is nothing but a line on the floor to represent the door.

As parts of the setting and of the characterization, costume and make-up should be introduced into the action at this point. The effect of a costume depends to a great extent upon its being properly worn. The posture and carriage of an actor may make or mar the effectiveness of a well-designed costume. Costume in turn has a definite effect upon the execution of business. The actress who has rehearsed a grand exit and who finds in performance that her train is in her way and catches on the properties and settings, may in her embarrassing predicament ruin an entire scene. Actors should, if possible, rehearse in costume from this point on in the schedule so that their costumes are as natural and comfortable to them in their rôles as their street clothes are in off-stage life. In some little theatres which have to rely upon the unsatisfactory substitute of costume rental, this practice may be prohibitive, because of the expense. In these organizations the director will have to make the best of his poverty by attempting to give the actors some idea of the costumes and their effect upon their action. In organizations in which the entire setting is designed and constructed by the theatre staff, the usual reason for not having costumes, properties, and scenery in time to coördinate these with the other elements of the production is that their preparation and construction was not properly scheduled and supervised by the director and technical director. As another element in the finishing of the production, make-up should be introduced at this point in the rehearsals. Each actor should be taught to do his own and to acquire speed and finish in doing it. Make-up, it may be repeated, must be harmonized with the lighting, as well as with the costume and the character.

58. *Movement*

With the elements of the play fitted together and placed in their environment, the succeeding rehearsals are directed toward securing a unified effect in the continuity of the whole. This involves first the movement of the whole play. The first question in this connection concerns the building of the action. Does the play move? Does it open interestingly, present its exposition neatly and deftly, arouse suspense, make its climaxes? When the curtain closes on the first and second acts, is there such a keen interest that the audience would like for it to open immediately to see what is to happen next? In short, does the action build from the first scene up to the crisis and down to the conclusion, or does it lag and drag along in disheartening fashion? If the play has been well written, and it should not be produced if it has not, the author has written this progressive development into it. But what the author has written may be killed by misunderstanding or poor production. It has already been seen that by the simple process of topping actors can make lines build. In the same way the scenes of an act can be made to build. Two other factors to be reckoned with in this connection are, first, the progessive entanglement of the action, which has been written into the play for this purpose and accomplished by means of a cause and effect relationship; and second, the gradual unfolding and development of character. These must be made evident by the director and the actors, in order to produce in the audience the feeling of witnessing and participating in the happening of an event.

59. *Tempo*

Closely bound up with the building of the action is the tempo of the play. It is well known that tragedy is slower and more measured in its general movement than is comedy. Every play has a general tempo that is part of its effect, and whether it be comedy or tragedy the tempo is individual to that composition. Much of the effectiveness of *Grand Hotel* was due to the rapid professional production. The leisurely, measured, stately tempo of Greek tragedy is easily recognizable. The rapid, bright, sparkling tempo of a Congreve comedy or a Wilde play is no less well known. The rapidity of the tempo in some scenes in Philip Barry's plays is part of the secret of their effect. The expressionistic dramatists have demanded such rapid, staccato, machine-gun tempo in some scenes, that they have utilized the so-called "telegram dialogue" to produce it. The enhanced effect produced by increased tempo in a scene between two quarrelling people is obvious. But the general tempo of a whole play is a complex matter. It is an integration of varying tempos of different scenes, and of tempo varying within single scenes. An accelerated tempo can be very effective in building scenes, in giving the effect of anger or excitement, and in increasing suspense. The reverse is no less effective. The effect produced when one of the two angry people suddenly slows the tempo and in a calm, level, deliberate voice delivers his line, can be readily imagined. To avoid monotony the tempo must be varied. But the tempo in any scene is dependent upon the effect aimed at and the characters playing it. Tempo alone will not produce an effect, however. It must arise out of character, out of emotion and feeling operating in a given situation.

A continually slow, dragging tempo is one of the most deadly faults that may occur in the production of a play. On the other hand, a play may be played at too rapid a rate. Never must the effect be given that the actors are racing against time. This is too frequently the effect produced when a director learns at the last moment that his performance is running too long, and attempts to correct this by accelerating the tempo. Proper timing of the action in designing and rehearsing it will prevent such a condition. The dress rehearsals are not the place in the schedule for this. The tempo of each scene should be observed in the business and line rehearsals, and the tempo of the acts and the whole play should be carefully set during the period of coördinating rehearsals.

60. *Timing*

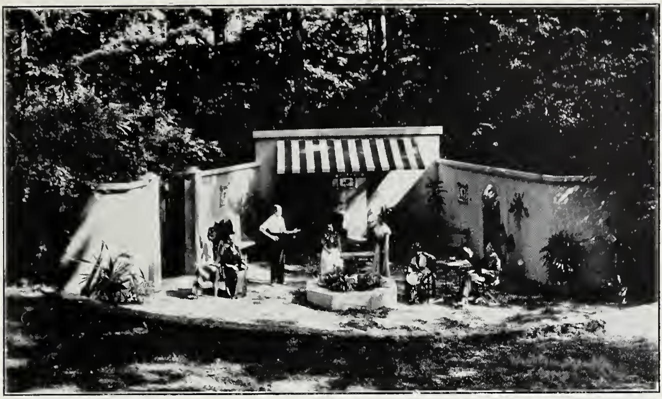
In setting this tempo, timing is a paramount factor. The tempo of an entire scene may be rendered ineffective by a badly timed piece of business or by poor timing of the handling of properties, or any other part of the action. Every piece of business on or off stage, every cross, entrance, or exit must be perfectly timed and executed to cue and in tempo. Frequenters of nonprofessional performances are thoroughly familiar with the ludicrous effect of a bell ringing or a shot fired off stage a few seconds too late. No less ludicrous is a cross improperly timed, or executed out of tempo. In all business the actor must measure his distance exactly and time the action to fit. In the same way all stage effects must be timed and cued. It is painful to see a lamp lighted on stage and half a minute or so later see the lights flash full up. All these matters must be perfected in these finishing rehearsals before the dress rehearsals are undertaken. In order to accomplish this, the action must be placed in its environment; it must be rehearsed with costumes, sets, properties, and effects.

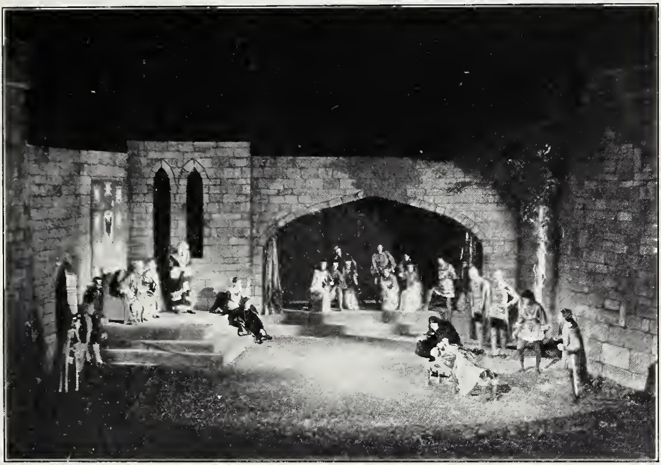
A further word must be added about timing, in reference to the playing of comedy. The effects of comedy are peculiarly demanding in this respect. Dependent in a large measure upon the element of surprise, much of the secret of provoking laughter lies in the exact timing of the line or action. A scene from Paul Green's *Quare Medicine* will serve to illustrate this. Old Grandpa Jernigan has just been caught by his daughter-in-law, Mattie, the neat, immaculate housekeeper who gives a speck of dirt no chance whatever, chewing tobacco and spitting in the fireplace. In his panicky attempt to conceal this he has tried to swallow the chew, but has been forced chokingly to disgorge it into the fireplace. This is an excruciatingly funny scene, sending the audience into gales of laughter when properly played. The fun is increased when the angry Mattie brings a pan and rag and forces the reluctant and abashed old man to clean the hearth. There he sits before the fireplace muttering and cleaning away in the most laugh-provoking fashion. As the amusement of the audience begins to subside, but before it completely dies out, his attention is caught by Mattie on the opposite side of the room industriously sewing for the heathen. The audience sees his attention caught, sees him lift his eyes and turn his head, and sees him slowly settle back to speak. Then when the actor knows he has their attention, he shoots his question.

> GRANDPA JERNIGAN. *Air . . . air . . . them fer the heathen?*
> MATTIE. (Snapping back crisply). *They air that.*

The crispness and snappiness of the answer cause his timidity to return somewhat. He absently gives the hearth another wipe with the rag, holding the audience's attention. Then in a burst, as though fearful that his courage might fail him:

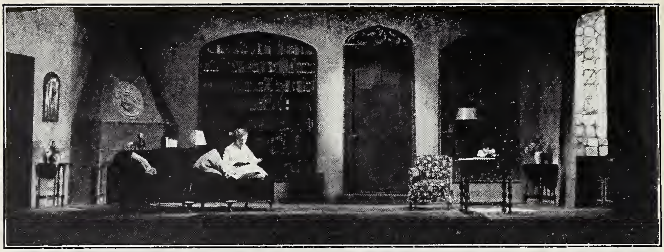
> GRANDPA. *Well, how you know they wear britches over thar?*

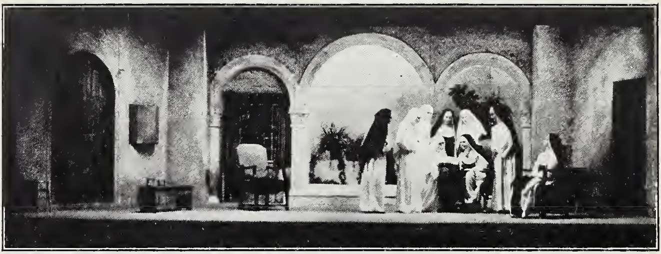




Wooten-Moulton

Settings for two plays presented by The Carolina Playmakers outdoors in their Forest Theatre at the University of North Carolina. Above, an afternoon patio scene designed by Ora Mae Davis for Serafin and Joaquin Quintero's comedy, *The Women Have Their Way,* directed by Harry Davis. Below, a night setting for *Hamlet,* designed and directed by Samuel Selden. The throne-room represented here is the center section of a large, three-part setting in and about which the entire action of the play was arranged.





Wooten-Moulton

Scenery for two plays produced indoors by The Carolina Playmakers. Above, the setting by Mary Dirnberger for A. A. Milne's *The Perfect Alibi.* Below, a setting by Samuel Selden for Martinez Sierra's *The Cradle Song.*

The actor has timed another big shot. More gales of laughter follow, increased by the indignant and furious peddling of the sewing machine by Mattie and the gleeful mirth of Grandpa at the success of his shot. Then as the audience begins to quiet down again, but before they have ceased laughing, Mattie replies:

> MATTIE. (Scornfully). *Who ever heard tell of the like! Why, you know they'd put 'em in jail fer sich . . .*

The *naïveté* of her answer gets another laugh, aiding in building the comical situation to its high point in Grandpa's next line. Her answer stops him for a moment (while the audience is laughing), but does not convince him. Settling back and facing her almost directly, he begins tentatively:

> GRANDPA. *Well, I hearn tell as how* (then shooting with full force, clear enunciation, and precision) *they don't wear nothing but a string around the waist to tell where the middle is.*

Startled at this freeness, and indignant both at what is said and at not being able to get around the old man, Mattie peddles the machine more furiously than ever. Grandpa cannot suppress his cackling laughter. If the scene is played well and timed correctly, the audience will respond with peals and peals of laughter.

That is precisely the effect it was designed for. To be sure its subject matter in itself would arouse amusement, even if the scene were merely read aloud to an audience. But to produce that continuous and vociferous manifestation of mirthful pleasure it must be played by competent actors who know how to time their lines and business exactly, how to catch the audience's attention properly, and how to build the comic effect from laugh to laugh up to the climax. This the director must teach his cast; but young actors will learn this fully only with experience. The fullest accuracy in such timing comes only after they have learned to feel their audience and to guide their effects by and in tune with the reaction of the audience. Training in rehearsals will aid them greatly in accomplishing this. It can at least teach them to wait for laughs and not to shoot their lines in the midst of audience laughter, thereby killing the laugh and losing their lines.

Another problem in timing that must be solved during these rehearsals pertains to the running time of the whole performance. An audience should not be held in the theatre more than two or two and a half hours. A performance that runs beyond two and a half hours wearies its spectators, dulls the part of the play which should be most emphatic (the ending), and destroys in a large measure the total effect. Conversely, a program that runs much under two hours makes the evening's entertainment seem too short. The director should know the exact playing time of each act and of the whole play. These should be timed before the dress rehearsals are begun. One of the major disasters that can befall a good performance is the long tiring waits between acts. There is no excuse for these. Proper planning and proper rehearsals will eliminate them. During these rehearsals, too, costume changes must be worked out and timed so as not to hold up the action of the play.

61. *Rhythm*

It is in this period of rehearsals that the rhythm of the whole composition is established. The importance of rhythm in characterization has been shown; it is no less important to each scene and to the whole composition. Mention has been made, too, of the effectiveness of a sudden change in tempo within a given scene. Now, as a matter of fact, the tempo of every scene, every piece of business, every line is constantly and subtly changing according to the stress and pull of the emotion behind it. Increasing intensity of emotion showing itself in an accelerated tempo is a well-known effect. These subtle variations of tempo produce the rhythm. In its simple and regular forms rhythm is easily recognizable; but in its more complex and subtle forms, although its effect is easily felt by everyone, it is difficult to describe. All artistic compositions have their dominant rhythm, but in a play it is an intricate and varied thing, made up of many parts. It must be sensed by the director and the actors, and made to play a part in the total effect.

It is part of the secret of the mood of the play, affecting not only every character, every scene, but also the settings, and especially the lighting. It is often the absence of the proper rhythm in lines and in business that makes many productions of negro plays seem so unnatural to Southerners, just as it was the superb employment of it that made the Theatre Guild performances of *Porgy*, under the direction of Robert Mamoulian, seem so eminently right. The beautiful way in which it infuses the productions of the Irish plays as performed by the Irish Players of the Abbey Theatre, accounts in part for their success.

From the beginning the director and his assistants must be cognizant of rhythm in the designing of the production, and the actors must be made to sense it and incorporate it in every scene. In these rehearsals while the parts of the whole composition are being fitted together and made to run smoothly, the rhythm of the whole must be given attention in the creation of the effect aimed at. Fortunately for the director, difficult and almost impossible as rhythm in the whole play is to define exactly in words, it is not so difficult to attain in production. If the characters have been truly conceived and are properly executed and if the action of the play has been fully grasped in its subtle building, the scenes will naturally from these take on a harmony of rhythm. But that is not to say that the rhythm of any part or the whole can be left to chance. It must be studied and rehearsed just as an orchestra studies and rehearses the rhythm of a symphony.

62. *Orchestration*

And now come the final rehearsals before the dress rehearsals. These rehearsals, which are devoted to the fitting of all these diverse elements into a beautiful composition and to orchestrating the whole design, are a logical continuation of the last series. In these the director almost ceases to be the coach and becomes the *régisseur par excellence.* And what are these rehearsals to accomplish? The following passage from an excellent book written twenty years ago will help to answer that. This book, *The Theatre* *of Today,* by Hiram K. Motherwell, should be a part of the study of every young director. From about 1910 on, he says, there appeared in Europe a new conception of the theatre:

> The peculiarly universal nature of the ideal theatre has caught hold of our imaginations. We begin to see that a drama is far more than characters speaking words and imitating, or attempting to imitate, literal facts. It is a series of pictures; why not give them the beauty which painters have, after centuries of study, given their canvases? It is a series of architectural designs; why not make use of the fine art of architecture? It is often rhythmic spectacle; why not apply to it the fine art of the dance? It is a kaleidoscope of colour; why not make use of the art of colour as the painters have mastered it? It is, in one way and another, a collection of blending sounds; why not mould these sounds together with the art of the musician? Further, the theatre, which is essentially a performance for the crowd, is the most democratic of all the arts; its subject-matter can come from all departments and planes of life, its art can be and always has been greatest when it presents that which is common to all men in such a way that it can be understood by all men; why not organize it so that it shall be the property and servant of all men, rather than the "cinematograph of the idle rich," or the pink tea of the literary select? The theatre, alone of the arts, can concentrate all the arts in the service of all men. It is this dream which has taken shape and commenced its incarnation in the last ten years.

Twenty years have passed, and yet how far from the realization of this new theatre are most theatres in America, professional and nonprofessional! For its realization the theatre must have an artist, a *régisseur,* at its head. That is what the modern director must strive to become. Mr. Motherwell's words are apt again in describing this *régisseur.*

> . . . there arises a man, new to the theatre [that is to the old theatre of thirty years ago], symbolic of its altered nature—the régisseur. The older theatre had appointed men to be responsible for the various parts of the drama; the régisseur is to be responsible for their harmony. But this is not enough, for one cannot harmonise parts that weren't made to harmonise. The régisseur must not only be responsible for the assembling

of the parts; he must be responsible for their designing and making from the beginning. So the régisseur becomes the autocrat of the modern theatre, caring for the design and equipment of his playhouse, planning and supervising the construction of his scenes and costumes, working out the details of scene shifting and building, determining the nature and even the details of the acting, and imagining the lights in all their variations, even down to the spotting of a certain part of a certain actor's robe at a certain point in his part. The régisseur, in short, is responsible for the *whole*.

All too frequently in the American nonprofessional theatre the director is this autocrat, but not this *régisseur* with artistic ability and training. That training he must strive to acquire. In the complex details of production, however, he will need to call trained assistants to his aid, artists of talent and experience to design and execute the costumes, the settings, and the lighting. It is his duty to coördinate the work of all these into a symphonic whole. After the parts have been put together, his concern in these last finishing rehearsals is with the orchestration of the *inscenierung*. Like the conductor of a great symphony he must weld scenes, lines, characters, lights, and colors—all the elements—into a beautiful and effective whole. The periods in the rehearsal schedule allotted to this will be far too few if the idea of the whole has not dominated every rehearsal and every drill period prior to them. Even then it will not suffice, if this conception of the whole has not been sufficiently communicated to the cast and to every responsible staff member. In these last rehearsals the production is to be given finish, and the unity of the whole made to appear. It is too late now to change radically old business or to introduce new. Interruptions and repetitions must be made, however. If the work of the preceding rehearsals has been done well, these should be few. Now it is the perfection of the totality of effect that is aimed at, and not the perfecting of isolated units, which should have been accomplished before. Whether or not the director is just "putting on another show," such as anyone may do, will depend upon his whole work from the first design to the last dress rehearsal.

G. Dress Rehearsals

But what are the dress rehearsals for if all this must be accomplished in the preceding rehearsals? They are primarily finished performances designed to give the whole production a "tryout." Professional producers, limited by the Equity ruling to four weeks of free rehearsal time, take their shows out of town to some nearby place for a tryout before opening in New York. Nonprofessional companies do not have this advantage, but they may gain something of it in their dress rehearsals if they are properly conducted. For this purpose many directors find it advantageous to invite a small, strictly selected audience to each of these. These rehearsals should be run through without interruption from beginning to end, with intermissions, exactly as are the performances. If the production bogs down at any point, making interruption necessary, it is an indication that the previous work has not been done well. The director with his assistant and the technical director, provided with pencils and note paper, should sit well back in the auditorium. Any corrections or suggestions should be noted, to be made later. After the rehearsal is concluded, the cast and the staff should be assembled on the stage or in the Green Room for conference. In this conference the suggestions and corrections should be proposed, and if necessary, appointments arranged for necessary drill before the next dress rehearsal.

The usual hectic and disorganized nature of the average nonprofessional dress rehearsal is well known. Many of them are pitiful, wasteful, and almost useless affairs. They not only sorely try the patience and temper of actors, directors, and staff, but they are also a source of great discouragement in that they make the previous weeks of work seem so fruitless of results. Amateurs often take refuge from this discouragement in the old falsehood: "A poor dress rehearsal means a good performance." The absurdity of such a statement is so obvious to all reasonable directors that it is a waste of effort to attempt to refute it.

Dress rehearsals need not be long, weary, disorganized, and frantic affairs. If they are, it is a clear indication that the director has failed in the organization of his production. A schedule such as has been set forth will, if adhered to, eliminate such inefficient procedure. The dress rehearsals should be tryout performances, which run as smoothly and as orderly as the final performances. If they are so conducted, they will greatly enhance the value and effectiveness of these final performances, and thereby the reputation of the organization.

There are circumstances, to be sure, in which an ideal rehearsal schedule, such as has here been outlined, cannot be applied. Forces beyond the control of the director may compel him to prepare the production of a play within a period of four weeks, or even ten days. Moreover, when costumes, equipment, or a theatre is rented, it may not be at all practicable to conduct the finishing and dress rehearsals according to the ideas expounded here. But if all the conditions were entirely amenable to the will of the director, it is quite probable that he would find that the successful production of no two plays would fit into exactly the same rehearsal schedule. The theatre is a place of constant change and compromise. The competent director is one who knows how to adjust to and utilize these. Whatever the schedule he adopts, and however he may do it, he must accomplish those things here discussed. If he is to attain success, he must proceed in some orderly fashion. The nature of that he must work out for himself. However and in whatever order he does it, the director in preparing a play for performance must design the production (*inscenierung*); select the cast; communicate the details of his design to the cast and familiarize the members with the parts they are to play in that design; train the cast in the execution of the business of the play, in the projection of the characters, and in the interpretation of the lines; and, finally, weld all these elements into a finished whole that will produce the desired effect upon an audience.

CHAPTER VI

THE PERFORMANCES

1. *The Director at the Performances*

The arduous work of preparation is at last completed. That end toward which it all has been shaped, the performances of the play before the public, arrives. The question that has been present from the time of choosing of the play, the answer to which now becomes the major concern of the whole theatre organization, is how will the performances "go over"? That question will be fully answered only after they are completed, and the criticisms are made. But the answer in a large part must be anticipated by the director in the right choice of the play, and in properly designing and projecting an effective interpretation of it. This requires knowledge and ability on the part of the director and his co-workers, and a planned and orderly procedure in applying those assets to the whole problem of interpretation. Briefly stated that is the thesis of this book.

As was indicated in the section on "Back-stage Organization" in the first chapter, the performances should run themselves under the guidance of a stage-manager. Any production which requires the director behind scenes to nurse it along has not been properly prepared or organized. The director should be free to watch the show from the front of the house, so that he can afterwards advise and comment in conference with his cast and staff. If the show has a long run, certain actors and scenes may need "touching up" from time to time in rehearsal when they tend to lag. To be able to do this most effectively the director should see the performances with the audience and from its point of view. Further, it is very necessary for the director of a little theatre which is producing regularly season after season to watch and study the audiences. Only by this observation can he gain the necessary knowledge to please them. Moreover, it is through an objective observation of performances which he has directed that he improves his art of directing. This objectivity is difficult for the director to acquire after he has worked for some time with the minute details of the whole production. Intelligent and unprejudiced criticism is perhaps the most effective aid in attaining it. He should strive to secure such criticism from intelligent spectators and through adequate reviews of the production. Few newspapers outside the large cities have reviewers capable of giving intelligent, thorough, and unbiased reviews, but most of them will gladly print such reviews by individuals not on their staffs if the organization desires and seeks them. Some directors encourage their audiences to send to the theatre written comments on the plays and productions, and find in these a valuable means of estimating the audience reaction and the effect of the performances. Such encouragement adds to the community interest in the work. Directors have often found in criticism an effective means also of dealing with temperamental actors.

2. *Programs*

Another consideration in connection with the final performances of the plays is the handbills, usually called programs. Some organizations pay for these by soliciting advertising copy to be inserted in them. This cheap and commercial practice, frowned upon by the better little theatre organizations, should never be resorted to except in cases of absolute necessity. The program as the first introduction of the performance to the audience and as the badge and representation of the organization should be made as attractive and pleasing as is possible. Its circulation will be the major means of acquainting many people, including the editors of magazines, with the work of the director and his organization. It need not be elaborate and excessively expensive, but it should be designed and composed as an impressive and lasting memento. Some theatres have developed an interesting and varied series of programs worthy of the collector's preservation and expressive of the character and tradition of the organization. Theatres in which there are competent artists who can execute them have often ornamented their programs with beautiful woodcuts or linoleum blockcuts in keeping with the theatre or the style of production which they represent. Others use a specially designed woodcut program heading or signet, emblematic of the theatre. Even without these, attention to the composition, style, typography, choice of paper, and of ink will result in making the programs attractive and distinctive. The advice of a good printer and a little experiment will aid any director to acquire the ability to present his work in artistic form through the program. In using colored paper, care should be exercised in selecting it and the color of the ink so that the program will not be difficult to read. Some little theatres use very elaborate programs for productions upon or in honor of special occasions, such as anniversaries. In the revival of old plays, programs in keeping with the play may be designed by imitating the theatre bills in vogue at the time of the original production. This method of program composition has been frequently used and proved especially effective in little theatre revivals of old melodramas.

3. *Parts of the Program*

The absolute essentials of a theatre program are the heading or title-page, and the body. It may also include an editorial section.

4. *The Title-page*

The heading or title-page tells who, what, when, where, either in that or some other order. The "who" is the organization (usually with the director's name included), the "what" is the play or performance to be presented with the author's name attached, the "when" is the date of the performance, and the "where" is the place of the performance. It may or may not be a full page, depending upon whether the program is printed as a single sheet or as a folded sheet. In addition to this necessary information, the title-page may include a program heading, a signet, and quotations or comment and explanation. The program heading is usually a woodcut or design containing the name of the organization. The signet is the device or emblem which the organization has chosen to represent it. Quotations, when they are included, are used because they are important to the play or the organization, such as the motto or aim of the organization or a passage that aids in giving an impression of the aim, mood, or effect of the play. Comment is, strictly speaking, editorial matter and is usually relegated to the editorial page or section of the program. Title-pages may include also in their composition borders, rules, and other printers' devices that may add to their effectiveness.

5. *The Body*

The body of the program includes the *dramatis personæ* with the names of the actors playing the various rôles, the time and place of the action of every separate scene or act, the program of music, the titles and names of the staff and crew, and the indications of intermissions. A usual practice in listing the *dramatis personæ* is to arrange them in the order of their appearance in the play, with the exception of mobs and crowds, which are listed in a group at the end. Descriptive captions or titles following the names of the characters are helpful to the audience (example: LADY JANE, *a deserted woman*........Lucy Smith). If the play is a one-set play, a single indication of the place will suffice; otherwise the time and place of each act and scene are indicated in order. Usually the place of the action is the more important of the two and is given first (example: Act I, Scene 1, *Elsinore. A platform before the castle. Midnight*). Into this arrangement of the time and place of acts and scenes should go the indications of intermissions including the length of each. Full credit should be given on the program to every member of the staff and stage crew for the work done on the production. Committees should likewise be accredited by being included. The director should be especially conscientious in seeing that this is done. The actors appear before the public and receive their due merit and acclaim, but these people belonging to the staff and crews work just as hard in their positions without this acclaim. The style and arrangement of this part of the program is, like the whole program, at the discretion of the director. It also should be made pleasing, effective, and representative of the organization and the play.

6. *The Editorial Section*

If the editorial section is included, it may first of all serve as a comment on the play, its history, author, former productions, nature, and idea. This section may also serve for announcements and indications of policy. Upon memorial and anniversary occasions it may include a history of the organization and its productions, and thereby be made a repository and announcement of the records and attainments of the theatre. Many directors use it also for the exposition of aims and ideas dominating the work of the organization. These brief comments may be made a very effective means of developing the community's interest in the little theatre.

7. *Procedure in Conducting Performances*

Some final suggestions on the performances may serve to close this discussion of the part of the production with and for which the director is directly concerned and individually responsible. Performances should begin on time, but in some instances it is necessary to "hold the curtain" for five minutes to allow a rush of latecomers to be seated without spoiling the opening scene. It may be repeated that the house manager and his staff should admit and seat the audience efficiently, quietly, and courteously. After the audience begins to assemble and throughout the performances absolute silence should prevail back stage. Few things are more amateurish than talking or noises such as hammering heard from behind the scenes during the course of a performance. As soon as in his judgment the audience is sufficiently assembled, the house manager informs the stage-manager that he may begin. From that point to the "putting away of the show," the performance is under his management. Upon this notice from the house manager, he starts the overture which he has timed for the exact duration required. Some minutes before the conclusion or preferably before the overture begins, the "asbestos" or fire curtain is raised. At the conclusion of the overture, the house lights are gradually "dimmed down" and the footlights, if they are used, are gradually brought up. This procedure is effective in establishing quiet in the audience, focusing their attention upon the stage, and adjusting their eyes to the change in light. If a gong or chimes are used, it is now sounded. Slowly and with dignity the curtain opens. Expectation and responsive attention hold the audience. The show is on! May it be a good one and have a long run!

PART TWO

CHAPTER I

THE PURPOSE OF SCENERY

THE whole art of the stage is the art of Presence. Presence in the theatre is the enkindling influence exerted by a personality of superior radiance. The personality may be that of a man or a woman, or it may belong to an inanimate object which, because of its association with human action, takes on a living quality. A rug, a wall, a chair, a dress, or a snatch of song may have a "presence."

The supreme stage presence is, of course, the actor's. Because he is the most direct and intimate embodiment of the playwright's vision, his radiant influence dominates all the others. In fact, in many periods of theatre history the actor has had to assume, not only the chief part, but all the responsibility for creating dramatic presence. And he has done it successfully. The early Greek players performed the numerous and widely different stories composed by Aeschylus, Sophocles, and Euripides before a simple stone façade. The actors of Shakespeare's time, using an open wooden structure with two levels, performed in an even greater variety of scenes. Molière often played on the barest type of platform with the help of no other scenic properties than a plain table and a pair of neutral chairs. It mattered little to Molière and his fellow actors whether they moved in front of the mirrored walls of a palace ballroom or the brick walls of a tennis court, or whether they walked on carpets or uncovered boards, because they were able to establish by their words and actions the atmosphere, or presence, of their surroundings.

Since Molière other artists have contributed to the effects of a stage performance. This is particularly true of the scenic artists. Sometimes, over-earnest to create surrounding forms which should exert upon the audience the influence of their own pictorial personality, they nearly destroyed the influence of the acting. Only in comparatively recent times has much thought been given to the efficient blending of the two arts. The guiding theories of the so-called "new stagecraft" became clearly defined only around the turn of the present century. In accordance with them, the actor's presence remains—or becomes again—the center of the dramatic design, but the "presences" of the scenic forms (walls, furniture, and lights) which surround him become increasingly important in the creation of a right mood for the player's actions, supporting the force of his influence on the audience.

Modern dramatists, striving for greater economy by omitting from their plays the long passages of description and exposition which slowed the action of older plays, depend more and more on the effects produced by stage settings to describe their characters and to project their stories. The significance they attach to the scenic environment of the dramatic action is indicated by the careful specifications they place in their stage directions.

Loretto Carroll Bailey begins her one-act play of frustrated desire, *Cloey,* in this way:

> "*When the curtain rises,* JOSEPH HALL *is sitting at a little walnut desk in* MRS. MOTSINGER'S *living room, busily chewing a pencil, and writing at intervals.* JOSEPH *is a rather good-looking man of thirty-five, pleasing—often appealing—but somewhat ineffectual. He fits rather nicely in the dim sitting room on the edge of "Germantown." It is a quaint, musty little room, with a great fireplace in the middle of the back wall, and shallow alcoves on either side of it. The light filters through small diamond-paned windows at the back of the alcoves, falling on dim and dusty books in the shelves, bringing faint color to the portrait above the fireplace—the portrait of a girl with a pretty, spirited face. . . .*" [1]

A full appreciation of the story of Joseph's ineffectual hope to better himself, Cloey's wistful longing for release, and Mrs. Motsinger's peculiar ordering of their lives would be impossible without that musty, dimly-lighted little room. Before the play is over nearly every object visible takes some part in the action—the table in the center, the high-backed chair by the fireplace, the curtains on the alcoved windows, the silver candlesticks on the mantel, and, above all the others, the portrait of Cloey's mother on the wall. *Cloey* is a play of presences.

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[1] *Carolina Folk Comedies.* Edited by Frederick H. Koch. Reprinted by permission of Samuel French, New York.

To perform Paul Green's *The House of Connelly* convincingly would be impossible without the interior of the proud old Connelly mansion, with its high, Georgian-paneled walls cracked and stained, and the portraits of the ancestors moldering in their frames. The decaying dining-room, decorated with ivy by the Connelly girls in a pathetic effort to recapture a little of the lost glory of Christmas, Mr. Green describes with great care. Before the scene in the old mansion, there is another scene laid in the fields near the house. The author sets the whole tone of his play in the opening paragraph of his stage directions:

> "*A late winter afternoon is over the fields, and across the land to the west a murky cloud creeps up the sky, lighted along its edge by a bluish tinge from the hidden sun. The air is raw and has the feel of snow in it. A rail fence grown up with an unkempt hedgerow of dead fennel weeds, poke stalks, and sassafras bushes crosses the foreground, rotten and spraddled, with a disused stile near the center. Close beyond it in the field, three stack-poles now empty and gaunt, stand up like black gallows-trees, with ragged wisps of hay clinging to the cross-pieces above. The decaying stalks and weeded hedge exude the rot of death into the air, and the mood of a heavy loneliness is over the earth.*" [2]

No play better than Eugene O'Neill's *Beyond the Horizon* illustrates the important part scenery plays in modern drama. Two views of the sitting-room in their farm-house effectively exhibit the deterioration of the Mayo family. In the second scene of Act One the affairs of the Mayo family are in good order, and the playwright notes:

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[2] *The House of Connelly and Other Plays.* Reprinted by permission of Samuel French, New York.

"Everything in the room is clean, well kept, and in its exact place, yet there is no suggestion of primness about the whole. Rather the atmosphere is one of the orderly comfort of a simple, hard-earned prosperity, enjoyed and maintained by the family as a unit." [3]

By the beginning of the third act the impractical Robert has failed. He has lost his idealism, the greater part of his property, his child, and his health. Both he and his wife have long since given up all hope of material betterment and have sunk into a condition of dull despair. Before a line is spoken, Mr. O'Neill gives his audience an immediate understanding of changed conditions by revealing an altered room. He describes in detail the smoky chimney on the oil lamp, the torn and dirty curtains in the window, the blotches of dampness which disfigure the wall paper, the faded carpet and the broken rocker. The playwright sums up by saying:

"The whole atmosphere of the room, contrasted with that of former years, is one of habitual poverty too hopelessly resigned to be any longer ashamed or even conscious of itself." [3]

The modern stage setting, it will be observed, not only describes character and creates mood for action, but also helps the player tell a story. If we should attempt to give an informal definition of scenery from the point of view of a modern designer in the theatre, we should say, perhaps, that it is the living *environment* of the actor. The able artist enters into close communion with the author and the director of a play, and then, with the design of the acting clearly in mind, conceives for it surrounding forms which project its meaning and intensify its effects. The walls, the doorways, the rugs, the tables, the chairs, and—above all things—the lights which he plans, will be not simply architecture, furniture and illumination; but objects possessing an animate, vibrant presence, exerting an influence which, blended with and through the acting, makes the audience understand and enjoy the play to the highest extent.

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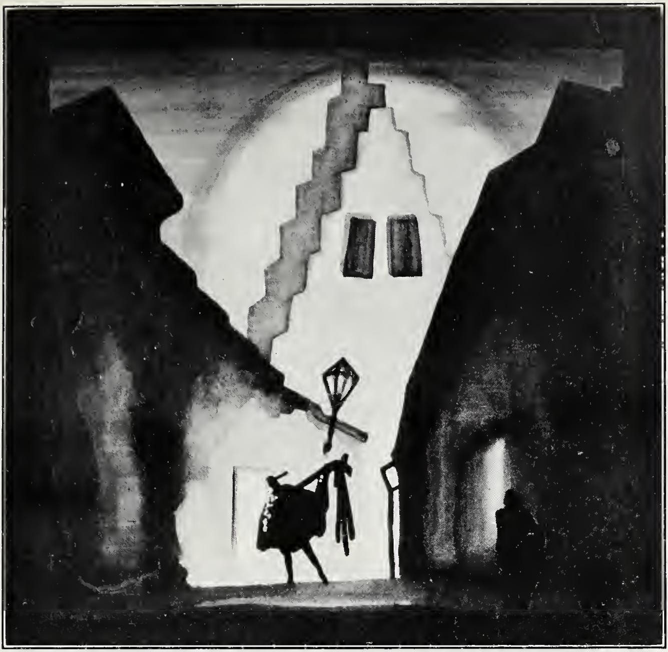
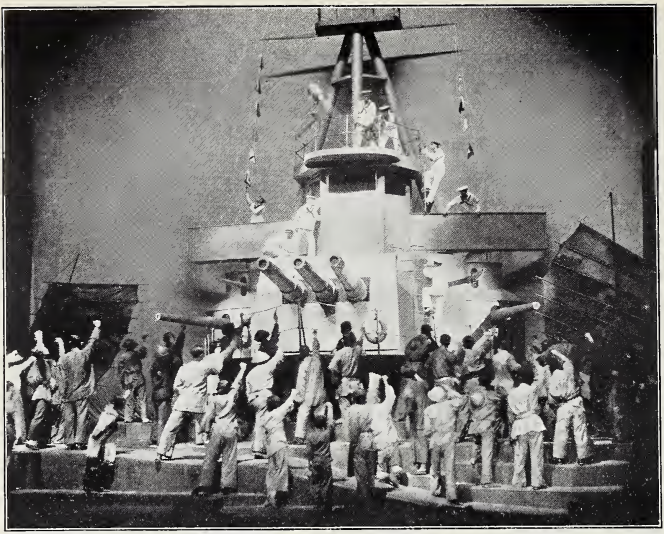
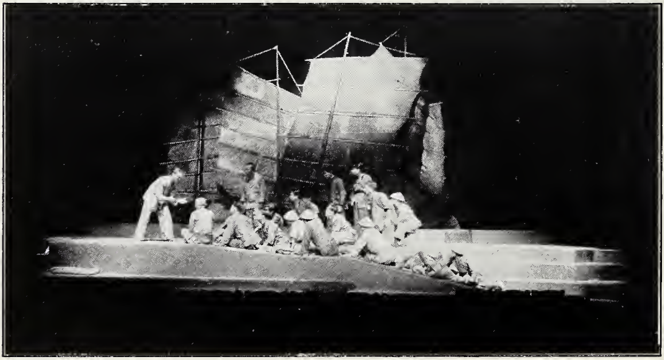
[3] Reprinted by permission of Random House, New York.



The purpose of the modern artist of the stage in designing a set of scenery for a play is to create a setting which shall put the spectator in the best possible frame of mind to understand and enjoy the play—in other words, to build an *environment* for the dramatic action in the play. An excellent example of such an *environment* is the street scene designed by Robert Edmond Jones for Gounod's *Faust,* produced by the American Opera Company.





Vandamm

Scenery designed pre-eminently for acting. Two phases of the famous setting arranged by Lee Simonson for Tretiakov's *Roar China,* as produced by the Theatre Guild.

CHAPTER II

THE FORM OF SCENERY

1. *The Topography of a Stage*

Before the artist and his partner, the technician (the two men in the nonprofessional theatre are frequently one), can begin to plan, build or paint workable settings for plays, they must know what are the principal structural features of a theatre, and what is the fundamental "anatomy" of scenic forms.

A modern playhouse, viewed as a lesser field for conquest than the Gaul described by Cæsar, may conveniently be divided into two parts, those sections which are commonly known in the theatre as the *front of the house* and the *back of the house*. In the "front" part are usually understood to be located the auditorium, the lobby, the patrons' lounges, the box office, and all other business offices. In the "back" part are situated the stage, the dressing rooms, the Green Room (if any), and all shops and store-rooms. The transverse wall separating the auditorium from the stage—and therefore, in effect, the "front" of the playhouse from the "back"—is the *proscenium* or *proscenium wall* (Figs. 1 and 2). The opening in this wall, through which the spectator views the stage, is called the *proscenium opening*, and the frame around it, the *proscenium arch*. Behind the proscenium arch, the spaces off stage to each side are the *wings*—that to the right, facing the audience, the *right wing*, that to the left, the *left wing*. Here are located the exit to dressing rooms, the loading door, through which scenery is brought in and taken out, often a door to a special property room, the switchboard, the counterweight system—if the equipment includes this (Chap. IV, Sect. 7)—stacks of scenery, properties, lighting apparatus, safety devices, a clock, and the stage-manager's prompt desk. The floor of the stage, made of tongue-and-groove yellow pine, is frequently pierced by *traps,* which open into the basement to permit the use of sunken stairways and the like. It is covered in performance by a large piece of heavy waterproof canvas, called a *ground cloth.* The *footlight trough* is located along the edge of the stage floor nearest the audience.

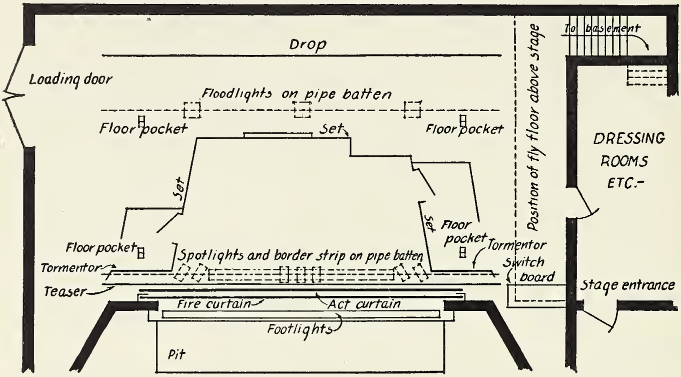

Drop
Loading door
Floodlights on pipe batten
Floor pocket
Set
Floor pocket
Set
Set
Floor pocket
Floor pocket
Spotlights and border strip on pipe batten
Tormentor
Teaser
Fire curtain
Act curtain
Footlights
Pit
Tormentor
Switch board
Position of fly floor above stage
To basement
DRESSING ROOMS ETC.-
Stage entrance

Fig. 1. The Plan of a Typical Stage

Showing the usual positions of the fire and act curtains, the teaser, tormentors, footlight trough, overhead lighting units, loading door, fly floor, and other features, beside a set of scenery in place. The stage is 52 ft. wide and 28 ft. deep with a proscenium opening of 28 ft. Scale ⅟16″ = 1′–0″. (See Fig. 2.)

At the top of the space above the proscenium, known as the *flies,* is the *gridiron,* or *grid,* a steel or wood framework of open beams placed five to ten feet below the roof, forty to a hundred, or more, feet above the stage, and extended over the entire working area. From this frame is suspended all the hanging scenery, such as drops, borders, tree trunks, etc., as well as certain lighting units. *Sets of lines,* attached to each hanging piece, are passed over pulley-blocks in the grid. The free ends of the lines are brought down and tied off on a double row of belaying pins, called the *pin rail,* on the *fly floor,* which is a shelf, or narrow gallery, extending

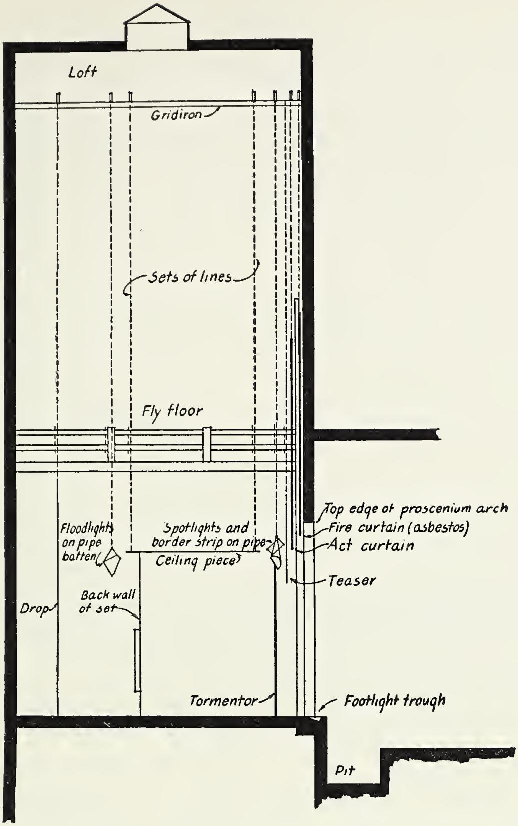

Loft
Gridiron
Sets of lines
Fly floor
Top edge of proscenium arch
Fire curtain (asbestos)
Act curtain
Floodlights on pipe batten
Spotlights and border strip on pipe
Ceiling piece
Teaser
Back wall of set
Drop
Tormentor
Footlight trough
Pit

FIG. 2. A VERTICAL SECTION OF A TYPICAL STAGE

Showing the positions of the fire and act curtains, teaser, one tormentor, footlight trough, overhead lighting units, fly floor, gridiron, and other features, beside a set of scenery in place. The stage is 28 ft. deep (from the curtain line), and the gridiron is 60 ft. above the floor. Scale 1/16″ = 1′–0″. (See Fig. 1.)

LIBRARY OF THE UNIVERSITY

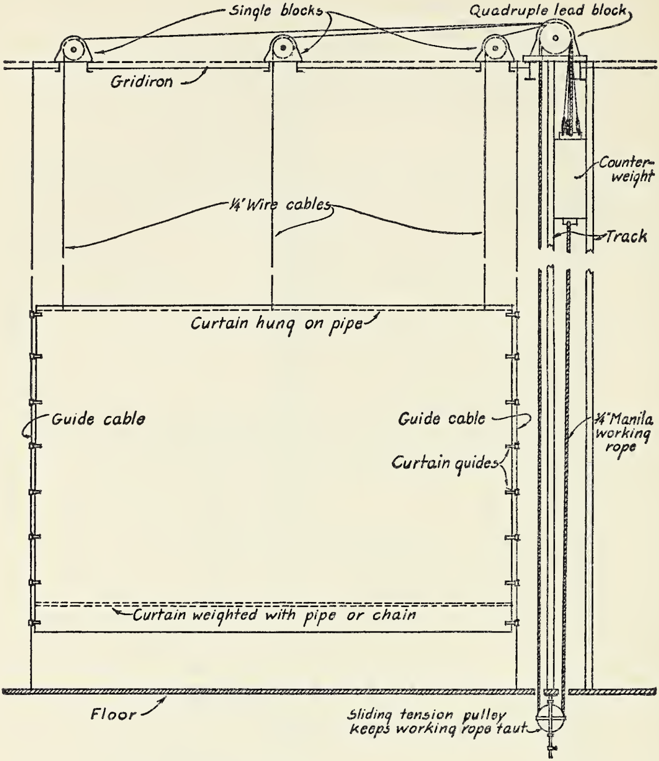

Single blocks
Quadruple lead block
Gridiron
Counter-weight
¼" Wire cables
Track
Curtain hung on pipe
Guide cable
Guide cable
¼" Manila working rope
Curtain guides
Curtain weighted with pipe or chain
Floor
Sliding tension pulley keeps working rope taut

FIG. 3. THE WORKING PRINCIPLES OF THE DROP CURTAIN

The size of the rigging parts in relationship to the curtain in this picture has been exaggerated somewhat in order to make clear the way in which they work.

along the wall of one of the wings some distance above the main floor. In many of the newer theatres the fly floor is omitted and all hanging scenery is handled with a *counterweight system* operated from the lower floor. The more common and the special methods of flying scenic units are described in Chapter IV.

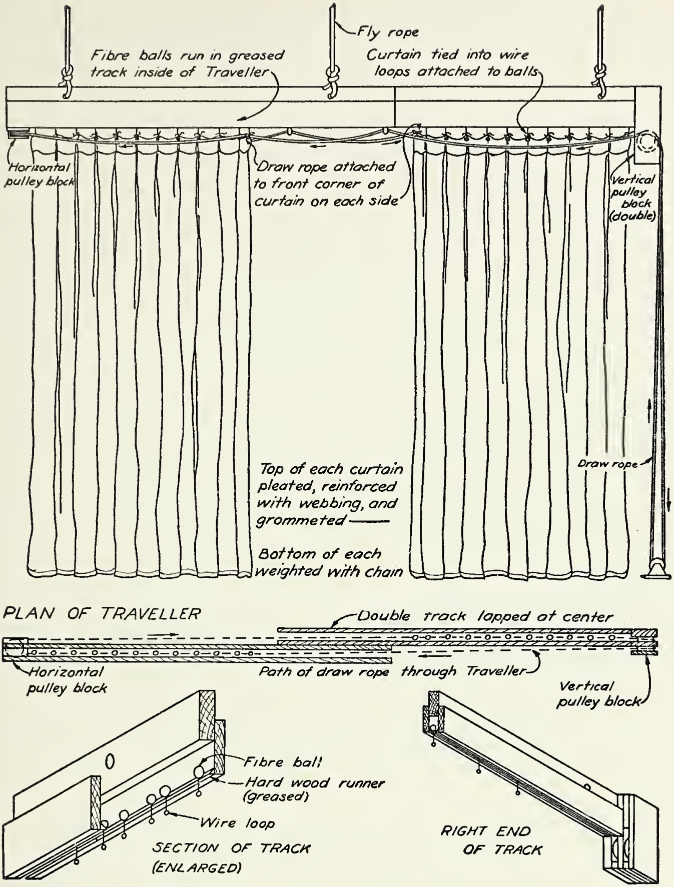

Fly rope
Fibre balls run in greased track inside of Traveller
Curtain tied into wire loops attached to balls
Horizontal pulley block
Draw rope attached to front corner of curtain on each side
Vertical pulley block (double)
Top of each curtain pleated, reinforced with webbing, and grommeted
Bottom of each weighted with chain
Draw rope
PLAN OF TRAVELLER
Double track lapped at center
Horizontal pulley block
Path of draw rope through Traveller
Vertical pulley block
Fibre ball
Hard wood runner (greased)
Wire loop
SECTION OF TRACK (ENLARGED)
RIGHT END OF TRACK

Fig. 4. The Draw Curtain on a Traveller

The path of the draw line through the traveller is indicated in the diagram just below the curtain. When the line is drawn in the direction indicated by the arrows the curtain is opened.

After a view of the skeleton of the stage and some of the permanent, built-in equipment comes the inspection of the principal adjustable pieces. Returning to the proscenium opening—the two perpendicular and movable screens that mask from the audience the spaces on each side between the down-stage edges of a set of scenery and the proscenium arch are the *tormentors*. These, together with the horizontal screen, or masking piece, known as the *teaser*—usually a simple, dark-colored piece of drapery suspended above, between the arch and the tormentors—form an adjustable inner frame for the stage picture. The *act curtain*, or *house curtain*, closes the proscenium opening between the arch and this inner frame. On most of the larger stages the curtain is of the *drop* type (Fig. 3), suspended from the gridiron, counterweighted, and operated with an endless rope. Other common curtains, used more frequently on small stages, are the *draw* type (Fig. 4), in which two sections, parting in the middle and tied to a number of wooden or fiber balls or wheels, sliding or rolling in a slotted track called a *traveller*, are pulled on and off without the raising or lowering of the curtain as a whole; and the *tableau*, or *tab*, in which the two sections are gathered up at the sides.

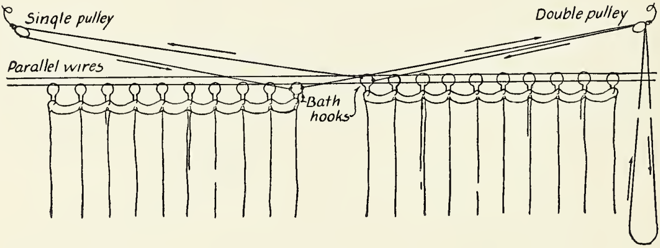


Fig. 5. A Simple Home-Made Draw Curtain on Wires

The two wires are fastened to the side walls of the stage at the same level and drawn taut by means of turnbuckles.

Fire regulations in most cities require that every theatre, commercial or otherwise, be equipped also with a steel or asbestos *fire* *curtain.* It hangs in front of the house curtain and, when dropped, completely seals the proscenium opening.

2. *The Anatomy of Scenery*

A set of scenery is made up of a number of wood and canvas screens, platforms, and other light framed pieces, which are so designed that they may be assembled or taken apart simply and quickly. Standard-made units, whatever their length, have a maximum width of only five feet nine inches. Frames of this size are easy to construct and cover (Chap. III, Sects. 4 and 5), and they are convenient to handle and to pack away (Chap. IV, Sect. 9).

The most common forms of unit scenery may be grouped under five general heads.

(A) STANDING UNITS:

flat (*plain*)—A tall screen made of wood and canvas, with a standard width of five feet nine inches, but no standard height, used as a section of a wall. (Fig. 18)

flat for a door—a flat with an opening for a door frame. (Fig. 20)

flat for a window—a flat with an opening for a window frame. (Fig. 20)

flat for a fireplace—a flat with an opening for a fireplace frame. (Fig. 20)

wing—two or three flats hinged together to fold inward, face to face. (Fig. 19)

door frame unit—a solid wood door frame made to fit in a flat designed for it. (Fig. 21)

window frame unit—a solid wood window frame made for a similar purpose. (Fig. 23)

fireplace unit—a fireplace frame, not always solid, made for a similar purpose. (Fig. 25)

(B) HANGING UNITS:

ceiling—a large, horizontal, canvas-covered frame, suspended by sets of lines from the grid, used to close the top of an interior scene. (Fig. 26)

drop—a large sheet of canvas, partly or fully framed, suspended vertically on a set of lines from the grid—commonly used to represent the sky. (Fig. 28) *border*—an abbreviated drop, used to represent foliage or to mask the flies. (Fig. 28)

cyclorama—a large curtain of canvas, or other material, hung from a horizontal U-shaped wood or metal frame suspended by sets of lines from the grid. (Fig. 30)

(C) BUILT-UP UNITS:

platform—a collapsible and portable frame platform constructed in unit sections. (Fig. 32)

steps—a light, portable run of steps constructed in unit sections. (Fig. 33)

column—a light frame or canvas column. (Fig. 34)

tree—a light frame or canvas tree trunk. (Fig. 34)

rock—a light, irregular frame-and-canvas imitation of a rock, made in unit sections. (Fig. 35)

built-up-ground—the same kind of an imitation of a bank of earth.

(D) SET UNITS:

ground row—a flat profile of a bank of earth, or a distant mountain, painted on thin three-ply veneer board, cut out, framed behind, and made to stand up independently on the floor. (Fig. 36)

Fence or wall—a frame imitation of a fence or wall, designed to stand up independent of other units on the floor. (Fig. 37)

(E) DRAPERIES:

Under this head may be listed a variety of curtain units, largely unframed.

These twenty units do not represent all of the "standard parts" of scenery. They are, however, some of the principal ones. The number of designs into which these twenty parts may be assembled is almost limitless. Flats, door, window, and fireplace units, ceilings, drops, and frequently steps, columns, and other units, may be combined to represent indoor scenes in a wide variety of shapes and styles; while drops or cycloramas, trees, fences, ground rows, and frequently flats, columns, and other units, may be put together to suggest out-of-door scenes in an equal variety of forms. These or other units, again, may be united to make formal, poetic, or expressionistic backgrounds.

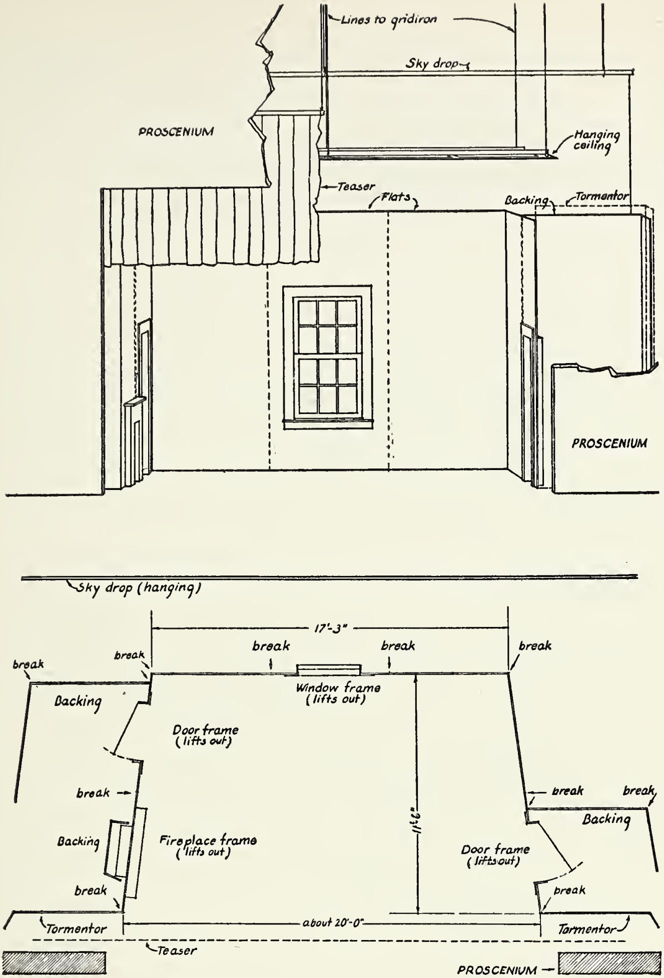

Lines to gridiron
Sky drop
PROSCENIUM
Hanging ceiling
Teaser
Flats
Backing
Tormentor
PROSCENIUM
Sky drop (hanging)
17'-3"
break
break
break
break
break
Window frame (lifts out)
Backing
Door frame (lifts out)
break
Backing
Fireplace frame (lifts out)
11'-6"
break
break
Backing
Door frame (lifts out)
break
break
Tormentor
about 20'-0"
Tormentor
Teaser
PROSCENIUM

FIG. 6. A SMALL BOX SET IN FRONT VIEW AND PLAN

Showing a typical arrangement of walls, door, window and fireplace frames, ceiling, sky drop, backings and front masking pieces.

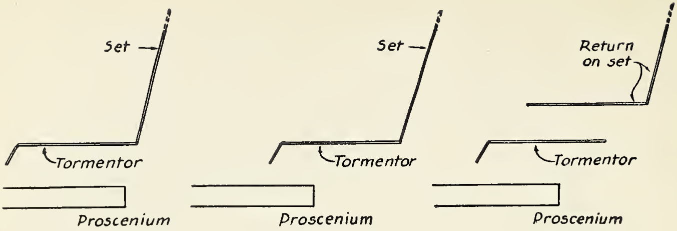

Set
Tormentor
Proscenium
Set
Tormentor
Proscenium
Return on set
Tormentor
Proscenium

FIG. 7. THE TORMENTOR AND THE RETURN

These diagrams show how the proscenium opening may be opened out or narrowed on each side by shifting the position of the tormentor, or by making use of an additional return. If side lighting units on standards are required on a set they are frequently placed between the tormentor and the return. In this case a 12″ or 18″ thickness is usually placed on the on-stage edge of the tormentor to shield the light from the audience, and the return is pulled back to allow the lighting unit to be angled freely onto the set. A teaser (see Fig. 6) serves as an adjustable masking piece above.

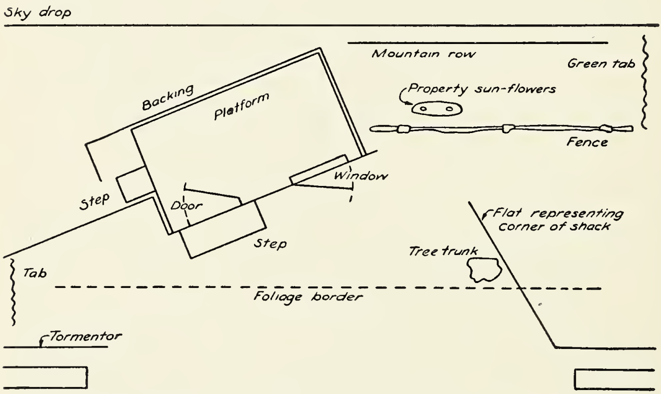

Sky drop
Mountain row
Green tab
Backing
Platform
Property sun-flowers
Fence
Window
Step
Door
Step
Flat representing corner of shack
Tree trunk
Tab
Foliage border
Tormentor

FIG. 8. THE FLOOR-PLAN OF AN EXTERIOR SET

This is the floor-plan of the setting for *A Shotgun Splicin'*, by Gertrude Wilson Coffin, opposite page 251.

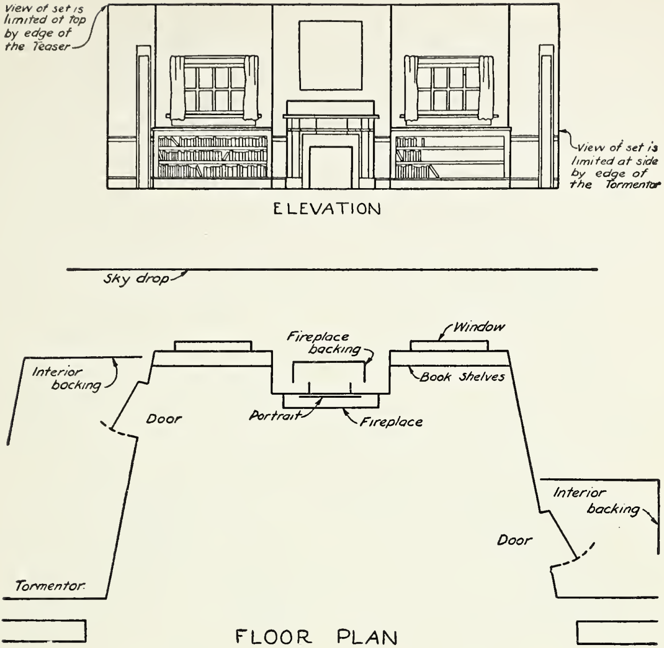
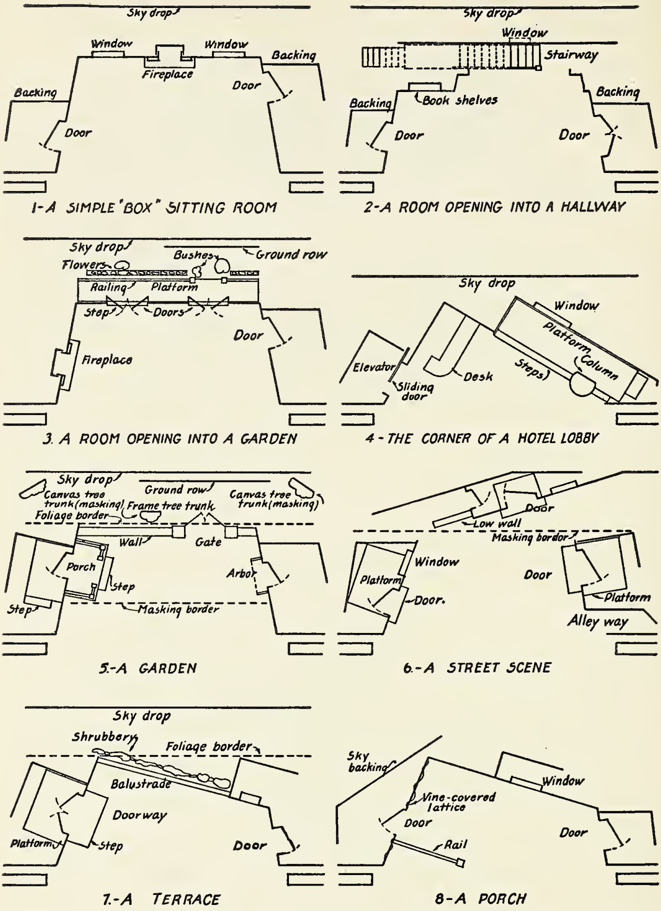

View of set is limited at top by edge of the Teaser
View of set is limited at side by edge of the Tormentor
ELEVATION
Sky drop
Fireplace backing
Window
Interior backing
Book Shelves
Door
Portrait
Fireplace
Interior backing
Door
Tormentor
FLOOR PLAN

Fig. 9. Elevation and Floor-Plan of an Interior Set

This drawing illustrates how standard scenery units are assembled to form a typical realistic interior setting. Included in this group are 2 plain flats, 2 door flats, 2 window flats, 2 jogs, 1 fireplace flat, 2 door frame units, 2 window frame units, 1 fireplace unit, 2 backing wings (behind the doorways), 1 fireplace backing, and 1 sky drop. The drawing also suggests how the designer may work out the elevation and the floor-plan of a set together. (See Chap. VI, Sect. 2.)

There is no standard arrangement of standard parts. Certain arrangements are, however, fairly characteristic of some of the more common classes of scenes. Several examples typical of their kind —realistic interior and exterior settings, and formal drapery-cyclorama settings—are illustrated in floor-plans in Figures 8–11.


Sky drop
Window
Window
Backing
Fireplace
Door
Backing
Door
Sky drop
Window
Stairway
Backing
Book shelves
Backing
Door
Door
Sky drop
Bushes
Ground row
Flowers
Railing
Platform
Step
Doors
Door
Fireplace
Sky drop
Window
Platform
Column
Steps
Elevator
Sliding door
Desk
Sky drop
Canvas tree trunk (masking)
Ground row
Canvas tree trunk (masking)
Frame tree trunk
Foliage border
Wall
Gate
Porch
Step
Arbor
Step
Masking border
Door
Low wall
Masking border
Window
Platform
Door.
Door
Platform
Alley way
Sky drop
Shrubbery
Foliage border
Balustrade
Doorway
Platform
Step
Door
Sky backing
Window
Vine-covered lattice
Door
Rail
Door

1-A SIMPLE "BOX" SITTING ROOM

2-A ROOM OPENING INTO A HALLWAY

3. A ROOM OPENING INTO A GARDEN

4-THE CORNER OF A HOTEL LOBBY

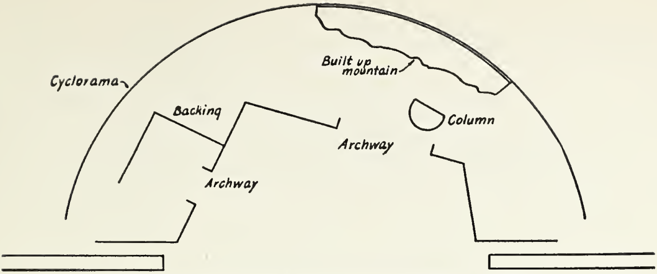
5.-A GARDEN

6.-A STREET SCENE

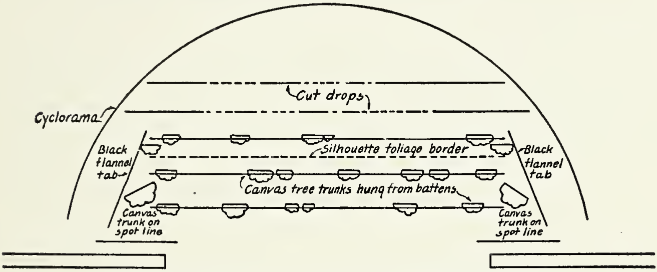
7.-A TERRACE

8-A PORCH

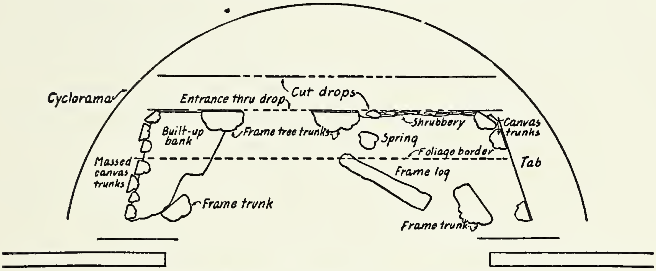
Fig. 10. Floor-Plans of Several Different Types of Interior and Exterior Settings


Cyclorama
Built up mountain
Backing
Column
Archway
Archway

FLOOR PLAN OF THRONE ROOM IN "EMPEROR JONES"


Cut drops
Cyclorama
Black flannel tab
Silhouette foliage border
Black flannel tab
Canvas tree trunks hung from battens
Canvas trunk on spot line
Canvas trunk on spot line

FLOOR PLAN OF WOODS SCENE IN "EMPEROR JONES"


Cyclorama
Entrance thru drop
Cut drops
Built-up bank
Frame tree trunks
Shrubbery
Canvas trunks
Spring
Foliage border
Massed canvas trunks
Tab
Frame log
Frame trunk
Frame trunk

FLOOR PLAN OF WOODS SCENE IN "IN ABRAHAM'S BOSOM"

FIG. 11. FLOOR-PLANS OF THREE SETTINGS WHICH MAKE USE OF THE SKY CYCLORAMA

The three settings were designed by Cleon Throckmorton for productions at the Provincetown Playhouse, New York.

CHAPTER III

THE CONSTRUCTION OF SCENERY

A. General Practice

1. *Some Practical Requirements of Scenery*

Scenery constructed for the stage must fulfill a number of practical requirements.

First, scenery must be capable of easy and rapid construction. The plan of production most frequently adopted by both professional and nonprofessional producing groups allows from three to five weeks only for the complete preparation of a play. Within this brief period, frequently briefer, the stage designer, his staff and crew, must design, draft, build, paint, and fit to the stage usually two or three—commonly more—whole sets of scenery. It is absolutely necessary, therefore, that this scenery be planned for the simplest and quickest possible methods of construction.

Second, scenery must be capable of economical construction. Unless great care is exercised the item of scenery on the final expense sheet of a production is apt to be a large one. It should be the purpose of the designer and his assistants, therefore, to keep down costs by choosing materials wisely, by adopting efficient methods of building, and, above all things, by avoiding waste.

Third, scenery must be capable of quick and silent shifting. That is, it must be constructed in light, well-shaped units which can be handled efficiently by a minimum number of stagehands.

Fourth, scenery must be strong. It must be able to resist considerable strain in the course of handling by stagehands and actors, especially when placed in service for repeated performances night after night. It must be firmly put together and well joined.

Fifth, scenery must be well assembled. The methods of fastening together the various units must be such that it will be unnecessary to drive a nail during the performance. Nothing sounds more amateurish to the audience than hammering on the stage. The assembling and the taking apart of the units should be handled at all times quickly and silently.

Sixth, scenery must be capable of storage. It must be so designed and constructed that when it is not in use it may be packed away on the stage or in a store-room in a minimum amount of space. That is, large two-dimensional units, like drops, flats over 5′–9″ wide (Sect. 7), and ceilings must be capable of being rolled or folded; three-dimensional frame units, like platforms, must be collapsible; thicknesses on archways and other flats must be removable; and other bulky, awkward units must be made either to be folded or to be taken apart in sections. Scenery which is to be sent on tour and must be planned for storage in a crowded boxcar should be constructed to fulfill the same list of requirements.

How the practical requirements of scenery construction here indicated may be met is discussed in the following sections of this chapter, and in the next chapter.

2. *Materials*

The following materials are essential for scenery construction:

LUMBER. Because all frames must be light and strong, only particular grades of lumber may be used. Requirements of shop and stage demand that the lumber be soft enough for easy working, light enough for easy handling, yet tough enough to stand considerable strain and wear. It must not splinter readily, it must not warp, it must be straight-grained and free from any large blemishes, and it must be well seasoned. By far the best wood for general scenic construction is good grade Northern or Idaho *White Pine*. This is the standard. Sugar pine is the best substitute. In an emergency, Douglas fir, yellow pine, and certain other soft woods, may be substituted; but none of these can approach the efficiency of white pine.

For ordinary purposes, the lumber should be ordered in strips 1″ x 2″, 1″ x 3″, and 1″ x 4″ by 12′–0″ to 16′–0″ long, dressed and surfaced. The first two widths are used in building flats, the last in building ceilings, door frames, etc. In surfacing a strip at the yard about ⅛″ is planed off the thickness and about ¼″ off the width, making a so-called 1″ x 2″ strip actually ⅞″ x 1¾″, and so on. This loss of lumber does not affect the carpenter, except in so far as he must make proper allowances in measurements during construction.[1] If the lumber man is obliging, he will prepare the strips [2] with a thickness of ⅞″, to accommodate theatrical hardware designed for it and, at the same time, with widths in even inches, to make the work of the carpenter easy.

Another useful wood material is 3-ply veneer board of basswood, whitewood (or other wood, preferably soft), called *profile board* in stage work. It comes in large sheets in several thicknesses (the most practicable of which are the 3⁄16″ and ⅛″), and is useful for all semi-rigid parts requiring lightness and toughness combined with flexibility. A strip of profile board can be bent into a fairly small circle without being cracked. It is employed to advantage in various kinds of light facings, such as risers for steps, curved backs of benches, ground rows, silhouettes, cut-outs, etc.

Nearly any cheaper composition board, such as *beaver board*, may be substituted where strength is not a consideration.

Covering Materials. Scenery is covered with either *canvas* or *muslin*. Flame-proofed linen canvas is used in covering most professional scenery. It is strong, has more elasticity than other materials, and it takes paint well. It is, however, rather expensive. Good scene linen, 72″ wide, costs from eighty cents to one dollar per yard. Duck canvas, which is also very serviceable, costs about half that. Muslin, the cheapest of all, is rather flimsy and can be used to advantage on small frames only. Where expense is a prime consideration, however, and the pieces to be covered are not large, it works well enough. If necessary, two 36″ strips may be seamed together to make a 72″ width, which will cost only about twenty

---

[1] Because mills vary a little in the amount of wood they remove in dressing a strip of lumber, this loss in width and thickness will not be taken into account at all (unless it is specifically stated otherwise) in the discussion of cutting-lengths of lumber in this chapter. That is, a 1″ x 3″ batten will be assumed, in the specifications, to be actually 1″ thick and 3″ wide. Each building carpenter, with the dressed size of his own lumber in mind, can make allowances whereever necessary.

[2] In the following Chapters the term *batten* will be used as a synonym for strip.

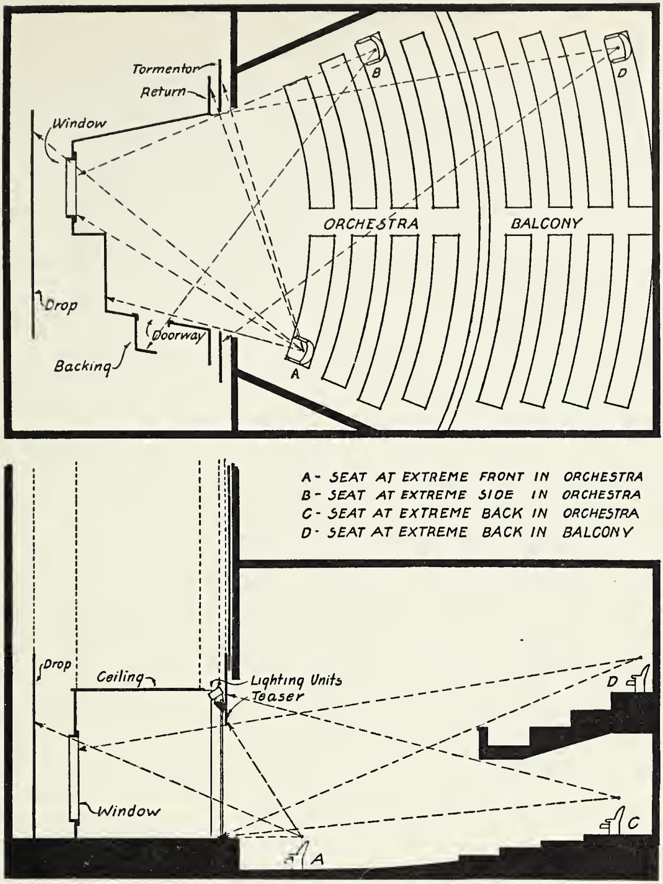

Tormentor
Return
Window
Drop
Doorway
Backing
A
B
D
ORCHESTRA
BALCONY
A - SEAT AT EXTREME FRONT IN ORCHESTRA
B - SEAT AT EXTREME SIDE IN ORCHESTRA
C - SEAT AT EXTREME BACK IN ORCHESTRA
D - SEAT AT EXTREME BACK IN BALCONY
Drop
Ceiling
Lighting Units
Teaser
Window
D
C
A

Fig. 12. Sight Lines

Good lines of vision to the stage from extreme positions in the auditorium require (1) the full visibility of the acting area and the chief features of its setting; and (2) the adequate backing of door, window and fireplace openings in the setting, and the complete masking of lighting units and stage machinery—for every position in the house (except, occasionally, a few of the first row seats, if these happen to be very close to the stage).

cents per yard for the double width. Drill, also, is a good covering material.

Hardware Materials. The following hardware must be ordered from some theatrical supply house (see concerns listed at the end of the book):

Lash cleats—Small hooks on the frame of a flat over which a lash line is thrown to bind the flat to another flat
Lash line eyes—Metal eyes to which the upper ends of lash lines are attached
Brace cleats—Small plates into which stage braces are hooked to prop flats up
Ceiling plates—Plates for bolting together and hanging ceiling frames
Hanging irons—Hardware for hanging scenery
Foot irons—Hardware for securing scenery to the floor
Stage picture-frame hooks and sockets—Hardware for hanging or otherwise attaching light units to other units
Corner-blocks and keystones—Small triangular and keystone-shaped pieces of 3/16″ profile board, used to reinforce joints

The following hardware may be secured from a local dealer:

Screws—No. 9 wood screws (7/8″ and 1½″)
  No. 8 wood screws (1½″ or 2″)
Corrugated fasteners—No. 5 (¾″)
Nails—Cement-coated wire nails (4, 6, and 10 penny)
  Finishing nails (assorted)
  1¼″ lath nails
  1¼″ clout nails
Tacks—No. 4 and No. 6 carpet tacks
Hinges—2″ tight-pin back flaps (that is, each flap 2″)
  2″ loose-pin back flaps (that is, each flap 2″)
  6″ strap hinge (that is, each flap 6″)
Bolts—3/16″ x 2″ stove bolts
  3/8″ x 2″ to 6″ carriage bolts with wing nuts
Door knobs and locks
Angle irons and flat corner braces—Assorted sizes
Pulleys—Assorted sizes
Sash cord—No. 8 (used for lash lines)
Soft-steel strips—3/16″ x 7/8″ strips to be made into saddle irons

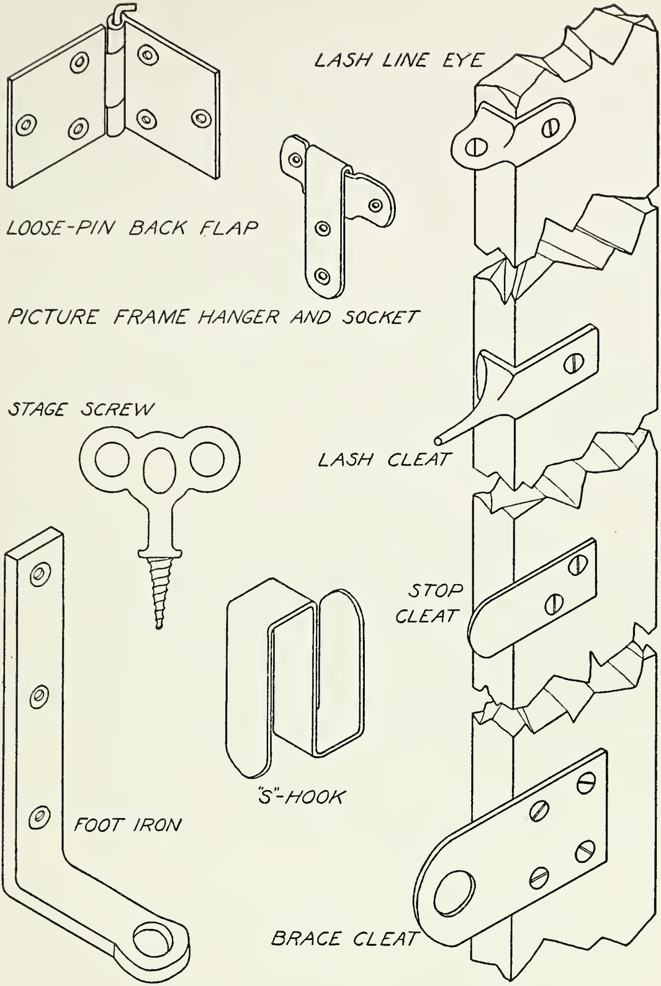

LOOSE-PIN BACK FLAP
LASH LINE EYE
PICTURE FRAME HANGER AND SOCKET
STAGE SCREW
LASH CLEAT
STOP CLEAT
"S"-HOOK
FOOT IRON
BRACE CLEAT

Fig. 13. Stage Hardware—Common Pieces

3. *The Procedure in Construction*

Before starting even the first steps in building, the whole plan of a set of scenery should be carefully drafted on paper. This plan is called the "working drawings" (Chap. VI, Sect. 5) and is usually supplied to the carpenter by the artist who designs the set. It includes complete diagrams—plan, elevation, and, where necessary, cross sections and details—of each unit to show beyond any question the exact construction of every part. In order to prevent any possible waste of materials, time, or good disposition,—caused by a completed set of scenery having to be cut over because the finished product does not check with the artist's original idea—a good carpenter demands to know in advance to the fraction of an inch just what he is supposed to do. If the carpenter is a man of experience, certain standard arrangements of joints, braces, and hardware may be omitted from the drawings, but enough detail should be included to make the plans clear.

With the working drawings before him, the carpenter is ready to start. He decides what materials are required. From stock he selects lumber of the right widths and thicknesses in lengths calculated to give the least waste. He examines each piece for straightness and absence of flaws. He sets the best pieces aside for use in parts that require the greatest strength and trueness, such as the side pieces of a flat, while he places any slightly blemished pieces in another pile for making into end rails, cross braces, etc. Before cutting the lumber, he removes the raw edges (called appropriately by stagehands the "curse") from each strip with a plane. This eliminates the great annoyance of splinters. A sixteenth of an inch is all that must be shaved off—removed by running the plane the length of each edge once.

Now the carpenter proceeds:

1. He measures carefully, cuts and marks the pieces of lumber to be used in the frame under construction. Accuracy here conserves both material, time, and temper.
2. He assembles the frame.
3. He "covers" the frame.

4. *Jointing*

The joint most commonly used on the stage is the simple butt, or right angle, joint reinforced with a corner block or keystone (Figs. 14 and 15). The two pieces to be joined are placed squarely together, one at right angles to the other, and two ¾″ No. 5 corrugated fasteners are driven in edgewise (teeth down), flush with the wood, across the seam. The corner block or keystone (small triangular or keystone-shaped piece of 3⁄16″ profile board) is laid above this and secured by a number of 1¼″ lath or clout nails. As the combined thickness of the ⅞″ batten and the 3⁄16″ block is 1 1⁄16″, the extra 1⁄16″ of the point of the nail protruding through must be turned by holding a flat, heavy piece of iron, called a *clinching iron,* against the under side of the batten. The easiest method is to send all the nails part way in at first, while the frame is flat on the floor or bench, (to prevent the parts slipping); then to lift the corner, place the iron underneath, and drive the nails in the rest of the way. The clinching helps to hold the joint rigid (Fig. 15).

Corner blocks and keystones should be set in ¼″ from the outer edge of the piece of scenery to which they are attached to prevent any possibility of their being caught against the corners of other pieces of scenery during scene shifts.

The regular corner blocks and keystones mentioned above are rather expensive when secured from theatrical firms. Substitutes can be made easily at home from 3⁄16″ profile board or any other thin 3-ply veneer, soft if possible. Corner blocks should be cut in triangles about 8″ x 8″ and keystones in rectangles 6″ x 3″. Sizes may be varied to suit needs. Composition board, such as beaver board, however, because it is not sufficiently tough, is of little value for reinforcing joints.

Screws hold more firmly than nails. Where real strength is required in the types of joint which cannot be reinforced by corner blocks and keystones (such as those used to put door and window frames together), screws only should be used.

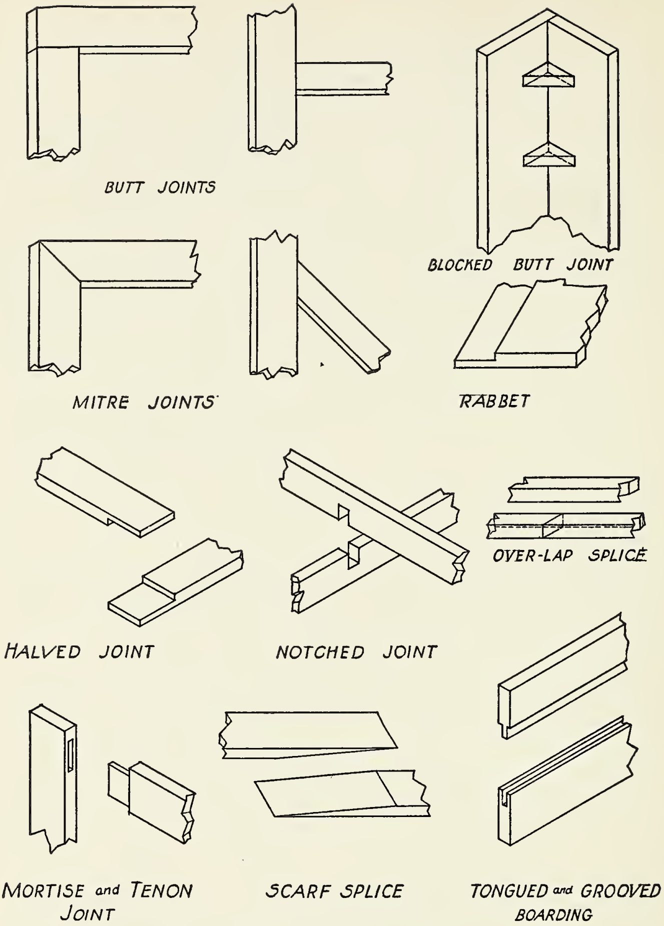

BUTT JOINTS
BLOCKED BUTT JOINT
MITRE JOINTS
RABBET
OVER-LAP SPLICE
HALVED JOINT
NOTCHED JOINT
MORTISE and TENON JOINT
SCARF SPLICE
TONGUED and GROOVED BOARDING

FIG. 14. SOME JOINTS COMMONLY USED IN SCENERY CONSTRUCTION

During the process of construction it is important to keep the frame absolutely square at all times. Corners should be tested frequently with the steel square. A flat that is even half an inch out of line will cause trouble when placed in the set.

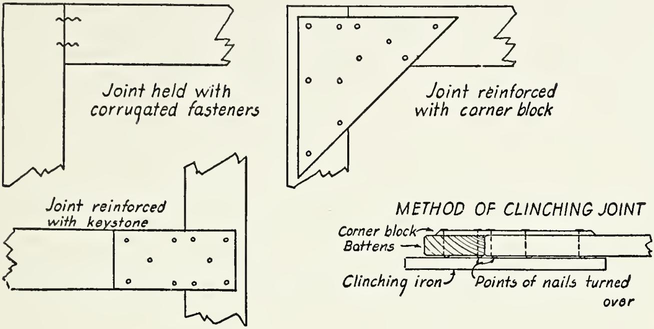

Joint held with corrugated fasteners
Joint reinforced with corner block
Joint reinforced with keystone
METHOD OF CLINCHING JOINT
Corner block
Battens
Clinching iron
Points of nails turned over

Fig. 15. Corner Block and Keystone Reinforcements

The profile plates shown here are of the smaller, "home-made" type. (See Sect. 4 and Fig. 18.)

After the jointing is completed, a frame is ready for "covering" and the application of the lashing hardware. It does not make much difference which is done first, although the usual practice is to apply the hardware before covering. (Sects. 6–7 and Figs. 17 and 18).

5. *Covering*

"Covering" is the term applied to the process of attaching a canvas face or surface to a frame. The method of covering a flat will be used to illustrate the steps in this process.

(a) Turn the frame over on its back so that the smooth side—that is, the side without corner blocks and hardware—is upward. Lay the canvas, or muslin, cut the proper length plus 2″ or 3″, over this. The frame is presumably 69″ (5′–9″) wide while the cloth is 72″ wide. Divide the spare material, so that about 1½″ extends over the frame all around. Stretch the canvas and fasten it in position with four No. 6 carpet tacks driven in, part way only, in the four corners.

(b) Now tack the canvas to the wood half an inch from the inner edge of the frame all the way around. Keep the cloth pulled evenly. A good plan is to tack one end first, then to walk to the other end and stretch the canvas from the first row of tacks while driving in the second row. Repeat this process on the sides. It is unnecessary to draw the cloth very tight in covering as the first coat of paint will shrink it somewhat. Do not fasten it to the toggle rail and the braces. Space the tacks about 6″ apart.

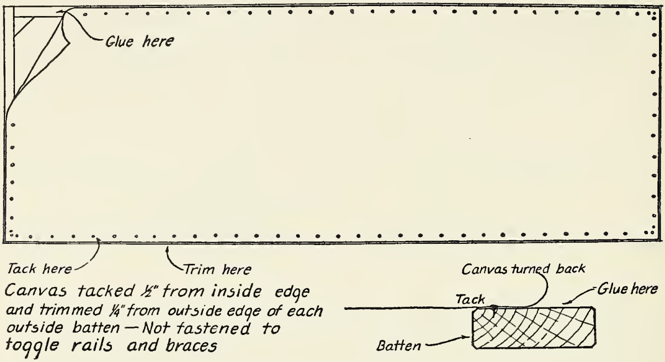

Glue here
Tack here
Trim here
Canvas tacked ½″ from inside edge and trimmed ¼″ from outside edge of each outside batten — Not fastened to toggle rails and braces
Canvas turned back
Tack
Glue here
Batten

Fig. 16. Covering the Frame

The canvas is stretched, tacked and glued on the face of the frame, the other side from that on which the profile reinforcements and hardware are placed.

(c) Remove the four temporary tacks in the corners and lay back the loose cloth. If the canvas has been properly secured to the wood, there should be a free flap about 4″ wide all the way around. This is pasted to the frame. To prepare an adhesive agent for this purpose mix 1 pound of flake or ground glue in 2 quarts of water in a pail, and cook this on a stove until it is thoroughly dissolved. Be careful that it does not burn. When glue burns, everyone within a radius of two blocks becomes aware of the fact. For safety's sake, it is well to put the vessel inside another containing a little water, in the double-boiler manner, with a small block at the bottom of the latter to prevent the inside pail from touching bottom. When the glue has completely dissolved, stir 1 pound of whiting into it. Turn the flap of muslin on the frame back and apply the mixture, while it is still hot, evenly and generously to the wood with an old brush. Do not place any over the edge; apply to one surface only. If the paste seems thin, let it congeal for a moment before applying the cloth to it. Use the edge of a keystone and a rag, dipped in warm water and wrung out, to rub over the glued area in order to make sure that the canvas sticks smoothly everywhere. Drive a couple of tacks into each corner, and trim the excess canvas with a sharp knife ¼″ inside the outer edge of the flat. This forces the cut edge into the wood, and prevents any fraying of the cloth when the set is handled.

Because wood does not take scene paint as well as cloth, all large wood surfaces, such as those on columns and steps, should likewise be covered with canvas. Brush the hot glue-and-whiting preparation over the surface to be covered, spread the canvas over it carefully, pull the canvas tight, rub it down, tack it down, trim the edges, and allow the glue to harden before painting.

6. *Fastening the Units Together*

There are three principal ways by which one unit may be fastened to another: (1) by a lash line, (2) by a loose-pin hinge, and (3) by a carriage bolt (Fig. 17).

(1) Flat, standing scenery, and occasionally tall built pieces, are tied together by the lash line method. This method makes use of a piece of No. 8 sash cord, called the lash line, and a series of small metal plates or hooks, called lash cleats, placed parallel to each other near to two adjacent edges. The lash line, attached to the upper right hand corner of one frame is tossed over the lash cleat placed a little below it on the other frame, slipped over a second cleat lower on the first frame, and so on down to be tied off on

two parallel cleats about 3′–6″ from the floor (Fig. 38). If the knot is a bow, it may be quickly untied when the scene is struck (Chap. IV, Sect. 9). This method of lacing two flats or other large units together works very satisfactorily.

(2) Certain small pieces, as well as most of the heavier units, such as platforms and stairs, are fastened to each other by what is commonly called the "pin-hinge." The full title of this humble piece of hardware, however, is a "2″ loose-pin back flap." One half of the hinge is screwed to the edge of each unit, and fastenings and unfastenings are made simply by inserting or removing the pin (Fig. 17). As the regular pin fits so snugly that it is sometimes difficult to put it in and take it out quickly, a short piece of heavy annealed wire (a little smaller than the pin) is commonly used

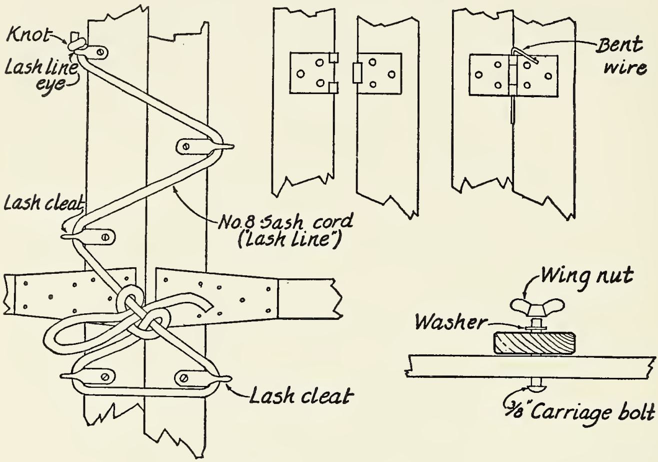


Fig. 17. Three Methods of Fastening Units of Scenery Together

Using the lash line, the loose-pin hinge and the ⅜″ carriage bolt with wing nut.

in its place. The top of the wire is bent over to prevent it from falling through.

(3) Many structural units, particularly those designed to bear some weight or strain, such as stretchers, temporary braces for platforms, and imitation beams, are fastened in place with ⅜″ carriage bolts put through holes bored in the frames to be joined, and drawn tight with a wing nut over a washer (Fig. 17).

B. Specific Practice

7. *Flats—Single Flats and Wings*

The height of a flat (Fig. 18),[3] which depends upon the size of the stage and the demands of the set for which it is designed, may be of practically any dimensions (though seldom over 20′–0″); but its width is not usually more than the standard 5′–9″. This width has been found to be about the most satisfactory. It makes the flat easy to construct and cover, easy to handle, and easy to store (see Sect. 1).

For a flat 12′–0″ high, cut from white pine stock (Sect. 2) the following:

2 battens 1″ x 3″ by 11′ – 6″ with square ends (stiles) [4]
2 battens 1″ x 3″ by 5′ – 9″ " " " (top and bottom rails)
1 batten 1″ x 3″ by 5′ – 3″ " " " (toggle rail)
2 battens 1″ x 2″ by 3′ – 6″ " mitred " (corner braces)

Place the first four pieces on the work bench or the floor and put them together in the form of a rectangle, with the two 5′–9″ rails lapping the two 11′–6″ stiles, as illustrated in the diagram. Making sure that the corners are absolutely square, first secure each joint by driving a couple of corrugated fasteners across the seam and then reinforce it with a corner block, in the manner described in Section 4. Place the 1″ x 3″ by 5′–3″ piece (the toggle

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[3] For the method of reading construction drawings, if this is not clear, see Chapter VI, Section 5.

[4] See footnotes at bottom of page 164.

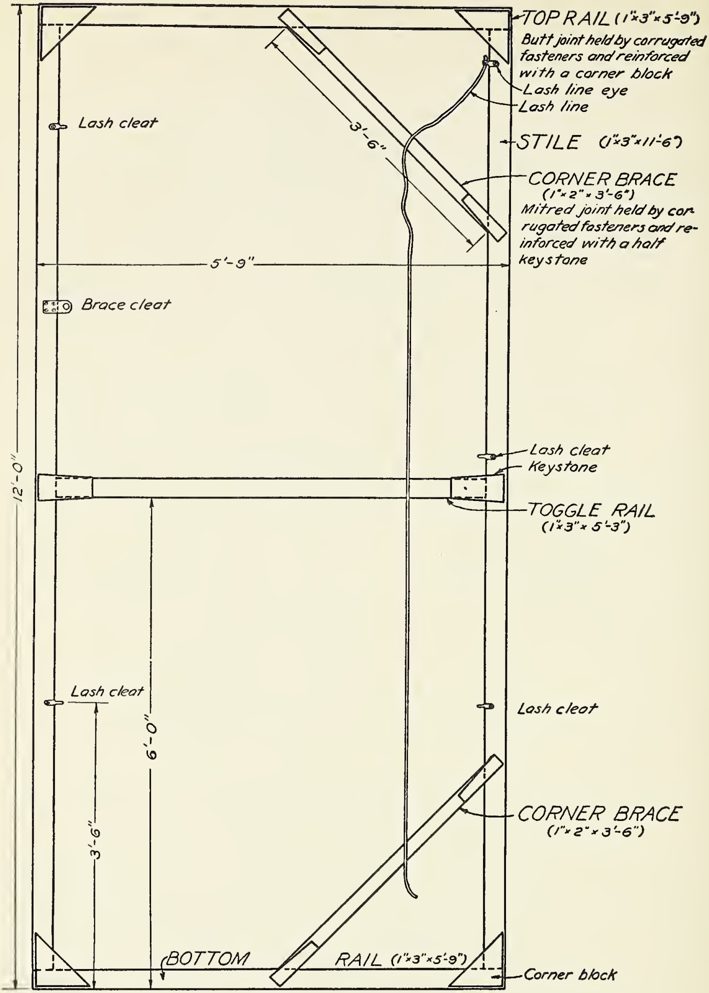

TOP RAIL (1"×3"×5'-9")
Butt joint held by corrugated fasteners and reinforced with a corner block
Lash line eye
Lash line
Lash cleat
3'-6"
STILE (1"×3"×11'-6")
CORNER BRACE (1"×2"×3'-6")
Mitred joint held by corrugated fasteners and reinforced with a half keystone
5'-9"
Brace cleat
12'-0"
Lash cleat
Keystone
TOGGLE RAIL (1"×3"×5'-3")
Lash cleat
6'-0"
Lash cleat
3'-6"
CORNER BRACE (1"×2"×3'-6")
BOTTOM RAIL (1"×3"×5'-9")
Corner block

Fig. 18. A Plain Flat

Rear elevation. The profile reinforcements shown here are of the larger "professional" size (see Chap. II, Sect. 4). Scale ½" = 1'–0".

rail) between the stiles 6′–0″ from the bottom, and the two mitred 1″ x 2″ by 3′–6″ pieces (corner braces) in the upper and lower right hand corners. Secure the corner braces with corrugated fasteners, but reinforce with keystones (which fit better here) instead of with corner blocks. A somewhat neater job is done if all the corner block and keystone parts are set in ¼″ from the edge. If one wishes to take the time, the edges of the blocks and keystones may be beveled off with a plane. If one flat is to be butted up against the back of another, to make a corner, the corner blocks and keystones along one edge of the flats should be set back ⅞″ (the thickness of a batten) in order to permit the making of a snug joint (Sect. 4). If the flat is over 12′–0″ high, one or more additional toggle rails will be necessary. Toggles in the frame should not be more than 6′–0″ apart. They may be less.

Apply the hardware. Place a lash line eye, or a screw eye with a ½″ hole, in the upper right-hand corner, a lash cleat just above the toggle rail on the same side, another one on the left side opposite a point half way between the first two plates, and two more, one on each side, 3′–6″ from the bottom of the bottom rail. If the frame is over 12′–0″ or 14′–0″, of course additional lash cleats are required. Attach brace cleats only to flats which need special propping-up by stage braces, such as those occupying a position in the center of a long straight wall, or those holding door frames. In an emergency, 6-penny finishing nails may be substituted for lash cleats and screw eyes with 1″ holes for brace cleats. It is to be understood, however, that the use of this emergency hardware is distinctly makeshift.

Cut a length of No. 8 sash cord long enough to reach from the lash line eye to within 3″ of the floor, put one end through the hole in the hardware, and knot it to prevent it from pulling through. The method of lashing two flats together is described in Section 6.

When the hardware has been applied, turn the frame over and cover it with canvas on the smooth side, that is, the side without corner blocks and keystones (see Sect. 5).

A jog, a narrow flat, is constructed in the same general way as the larger unit. If the jog is very narrow, the two corner braces may be omitted.

A two-fold, a combination of two flats, is hinged so that the members fold face to face. Three or more 2″ tight-pin back flaps are used to fasten the two frames together; and a 5″ strip of canvas is glued and tacked carefully over the crack, on the front (hinged) side, to prevent light from shining between the flats when the two-fold is set up. A three-fold wing is built in the same way, except that an extra 2″ batten, called a "tumbler," must be hinged between No. 2 flat and No. 3 flat to allow the latter to fold over the edge of No. 1 when the combination is closed up. In this way whole walls are often constructed in one piece. (Fig. 19).

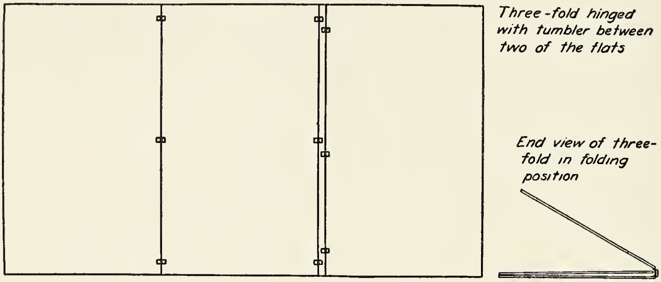

Three-fold hinged with tumbler between two of the flats
End view of three-fold in folding position

FIG. 19. THE THREE-FOLD

The special construction of flats for doors, windows and fireplaces is shown in Figure 20.

8. *Doorways*

A door frame unit (Fig. 21) consists of a solid "shutter" hung in a frame "casing," built usually of 1″ x 4″ to 6″ white pine stock and profile board. A section of the casing itself (Fig. 24) includes a box, or thickness, the part that fits into the wall; and a facing, or trim, parallel to the surface of the wall at right angles to the thickness. The door is set back in the casing, so that when the door is closed it shows the thickness; and the door is commonly hinged in such a way that when it is opened it swings off and up stage.

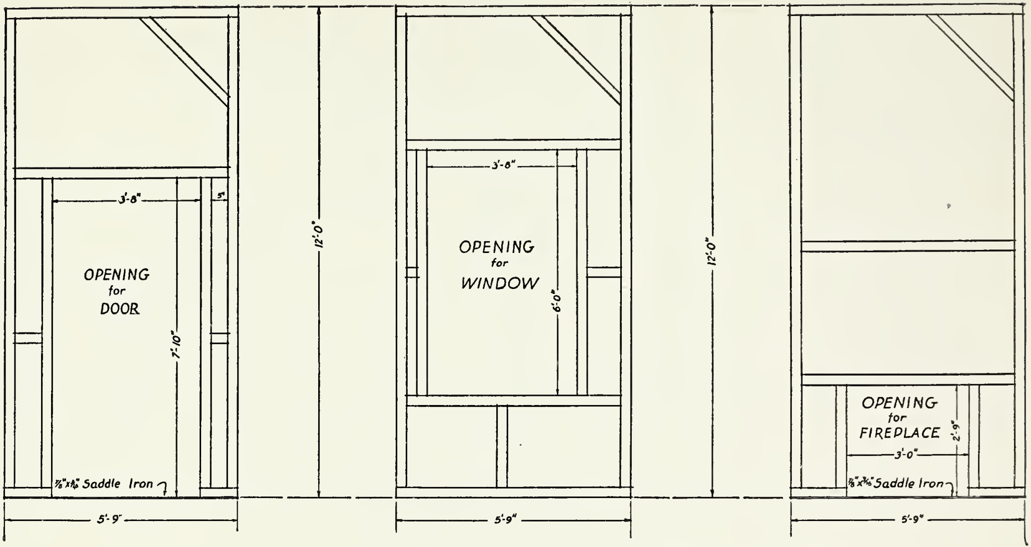

OPENING for DOOR
3'-8"
5"
7'-10"
7/8"x1/4" Saddle Iron
5'-9"
12'-0"
OPENING for WINDOW
3'-8"
6'-0"
5'-9"
12'-0"
OPENING for FIREPLACE
2'-9"
3'-0"
7/8"x3/16" Saddle Iron
5'-9"

FIG. 20. FLATS FOR A DOOR, A WINDOW, AND A FIREPLACE FRAME

Rear elevation. All joints are reinforced with corner blocks and keystones. Scale ¼″ = 1′–0″.

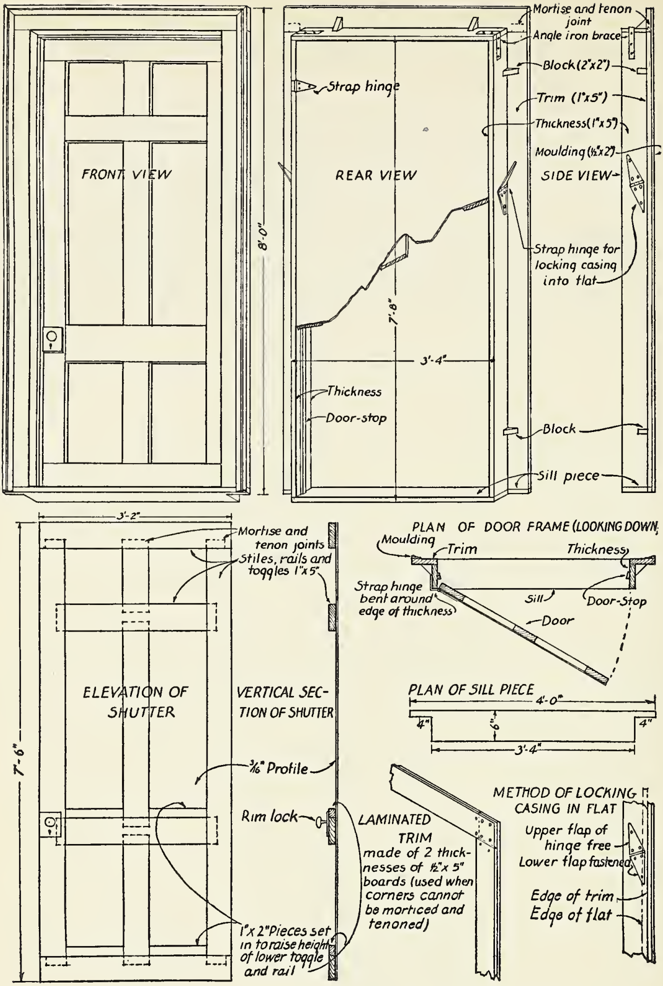

Mortise and tenon joint
Angle iron brace
Block (2"x2")
Trim (1"x5")
Thickness (1"x5")
Moulding (½"x2")
SIDE VIEW
FRONT VIEW
REAR VIEW
Strap hinge
8'-0"
7'-8"
3'-4"
Strap hinge for locking casing into flat
Thickness
Door-stop
Block
Sill piece
3'-2"
Mortise and tenon joints
Stiles, rails and toggles 1"x 5"
PLAN OF DOOR FRAME (LOOKING DOWN)
Moulding
Trim
Thickness
Strap hinge bent around edge of thickness
Sill
Door-Stop
Door
ELEVATION OF SHUTTER
VERTICAL SECTION OF SHUTTER
7'-6"
PLAN OF SILL PIECE
4'-0"
4"
6"
4"
3'-4"
3/16" Profile
Rim lock
LAMINATED TRIM made of 2 thicknesses of ½"x 5" boards (used when corners cannot be morticed and tenoned)
METHOD OF LOCKING CASING IN FLAT
Upper flap of hinge free
Lower flap fastened
Edge of trim
Edge of flat
1"x 2" Pieces set in to raise height of lower toggle and rail

Fig. 21. A Door Frame Unit

Front, rear and side views, section and plan of the casing and shutter. Scale ⅜″ = 1′–0″.

Because the casing can be constructed to fit the shutter more easily than the shutter can be made to fit the casing, it is wise to build the shutter first. The most common form of door is the paneled one. It is made by fastening (by means of ⅞″ No. 9 screws) a sheet of profile board to the back of a light skeleton of 1″ x 4″ to 6″ stock, as illustrated in the drawing. The skeleton which represents the raised framework of the paneling should, if possible, be fastened together by means of mortise-and-tenon joints (glued and nailed without keystones). If tools for making this type of joint are not at hand, the 1″ x 4″ (or 6″) pieces may be attached directly to the profile board. Fasten each piece of the heavier wood to the profile board with a couple of nails; then turn the door over and secure all the pieces with screws. If the latter method of building a shutter is employed, be certain that the sheet of profile selected for the back is absolutely flat, and heavy enough to keep the shutter hanging true. If a door of any size is to be made this way, it is wise to use wood of ⅜″ thickness, instead of the usual lighter profile. Good ready-built shutters can often be picked up quite reasonably at the lumber yard. The only disadvantage of stock doors is that, being built for long wear, they are apt to be heavy.

The casing, as has already been stated, is built in two parts—a *thickness* and a *trim*. The thickness, made just large enough to fit the shutter comfortably, is constructed first. Cut out of 1″ x 5″ (to 6″) stock (or heavier if the door unit is to be large) three straight pieces for the two sides and the top, and a winged piece for the bottom. The width of the last piece should be that of the others, plus the thickness of the trim. Put the four pieces together with right-angle box (butt) joints held by 1¾″ No. 9 screws. Wood splits very easily when long screws are driven into it. To prevent this from happening, first make a hole by using a hand drill with a ⅛″ bit, or by driving in and drawing out a 6-penny nail, and then inserting the screw. The head and the sill should lap the edges of the jambs. The sill is attached in such a way that its extra width extends to the front. The trim is fastened with screws to the thickness, at right angles to the latter, all the way around except across the bottom. Its lower edges meet the two narrow wings on the sill. The latter is secured to the former by means of 1¾″ No. 9 screws put through from below. The sill piece (sometimes called the "saddle") will sit more steadily on the saddle iron of the flat into which the door frame is placed (see below) if a shallow groove is cut in the bottom of the sill.

Use mortise-and-tenon joints, if possible, for fastening together the three members composing the trim. If this cannot be done, build the trim out of two layers of ½″ stock, and lap the corners. That is, cut the three pieces for the first layer so that the two side pieces will extend the full height of the trim and the top piece will fit between them; and cut the three pieces for the second layer so that the top piece will extend the full width, and the side pieces will fit below it. Thoroughly firm corner joints will be obtained if the second layer is bound to the first by a number of screws, or 1¼″ lath nails driven through and clinched on the under side (Sect. 4 and Fig. 15). For further strengthening, a few 1″ x 3″ x 4″, or larger, rectangular or triangular blocks may be placed in the angle formed by the meeting of the thickness and the trim. In Fig. 21 the blocks are shown to be small triangular pieces. The more usual shape is the larger elongated triangle, indicated in Fig. 22.

The shutter is hung in the casing by means of two 6″ strap hinges, usually placed on the outside. One flap of each hinge is fastened to the shutter, and the other flap is carried over the edge of the thickness, bent, and attached to the side of the latter. Small strips of ¾″ x ⅜″ wood, called door stops, are nailed around the inside of the casing to prevent the door from swinging the wrong way.

The appearance of a door unit is usually very much improved by the addition of a little molding.

Both door and window units are contrived to lock into their respective flats. To make this possible the 6″ strap hinge is again brought into service. One of these hinges is fastened to the thickness, part way up, on each side (Figs. 21 and 22). It is set at an angle, as illustrated, and only the lower flap is screwed to the wood, the upper flap remaining free. In setting the scene the free flaps are raised, the thickness part of the frame is put through the opening in the flat, and the free flaps of the hinges are lowered to bind the door and casing against the 1″ x 3″ upright battens of the flat that form the sides of the opening. The trim, resting against the surface of the flat on the inside, prevents the frame from falling out.

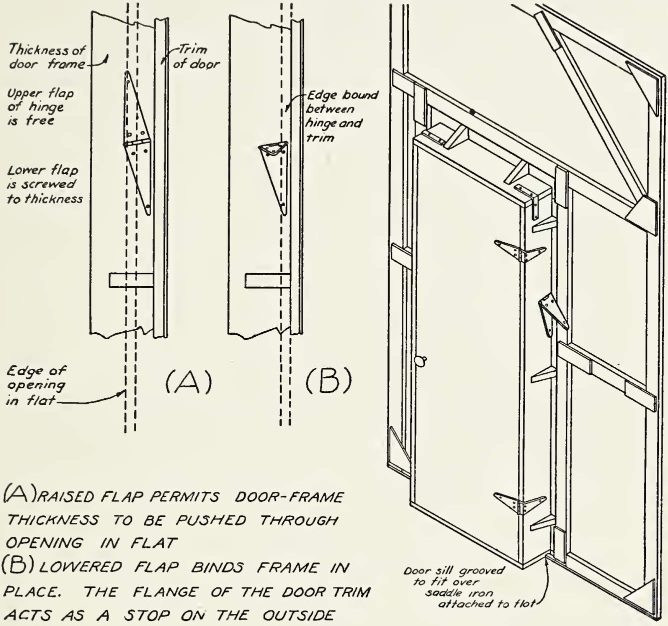

Thickness of door frame
Trim of door
Upper flap of hinge is free
Lower flap is screwed to thickness
Edge of opening in flat
(A)
Edge bound between hinge and trim
(B)
(A) RAISED FLAP PERMITS DOOR-FRAME THICKNESS TO BE PUSHED THROUGH OPENING IN FLAT
(B) LOWERED FLAP BINDS FRAME IN PLACE. THE FLANGE OF THE DOOR TRIM ACTS AS A STOP ON THE OUTSIDE
Door sill grooved to fit over saddle iron attached to flat

Fig. 22. The Strap-Hinge Method of Locking Door, Window, and Fireplace Frames into Their Flats

In order to permit room for the strap hinges and the little rectangular reinforcement blocks in the angle of the trim and thickness on the casing, and to make it possible to lift door and window frames out and in easily, the openings in the flats should be a little larger than the height and width of the thicknesses. Allow about 3″ clearance all the way around. That is, if the over-all measurement of the part of the door frame that comes through it is 7′-8″ x 3′-4″, the opening in the flat should be 7′-11″ x 3′-10″. If the little rectangular reinforcement blocks are not used on the casing, a clearance of 1″ all the way around will be ample.

If a door unit is to be left in a flat through the whole of a performance and set or flied with the flat (as it often is in the practical theatre), the door unit may be fastened in place by means of two or four ⅜″ bolts (put through the trim of the door unit and the frame of the flat), instead of using the strap hinges.

A door unit should be well made. If it is loosely put together, it will sag after a little use, and the shutter will bind against the casing. A firmly constructed unit, on the other hand, will last for years.

The construction of a flat designed to hold a door frame is illustrated in Figure 20. Notice that the usual toggle rail is raised to form the top of the opening and two extra uprights are placed between this and the bottom rail. The part of the bottom rail between the uprights is cut away. In order to prevent the two legs from racking, a 5′-9″ piece of ⅞″ x 3⁄16″ soft steel called a saddle iron, drilled and countersunk to accommodate No. 9 wood screws, is fastened to the bottom edge.

9. *Windows*

A typical double hung window unit (Fig. 23) consists of two sash frames sliding between ¼″ x ¾″ strips of wood in a casing similar to that used with the door (see Figs. 21 and 24). The general plan of construction for both units is the same. Sash weights and other hardware are seldom used on windows. If one sash must be raised, it can be held in place temporarily by means of a nail, or some other simple fastening. Because real glass is shattered so easily, it is desirable to use in its place for panes galvanized wire screening tacked to the back of each sash.

The unit is said to be "practical" if it can be opened, "impractical" if it is permanently closed. The window casing is fastened into its flat by either the strap-hinges or the bolt method described in the preceding section.

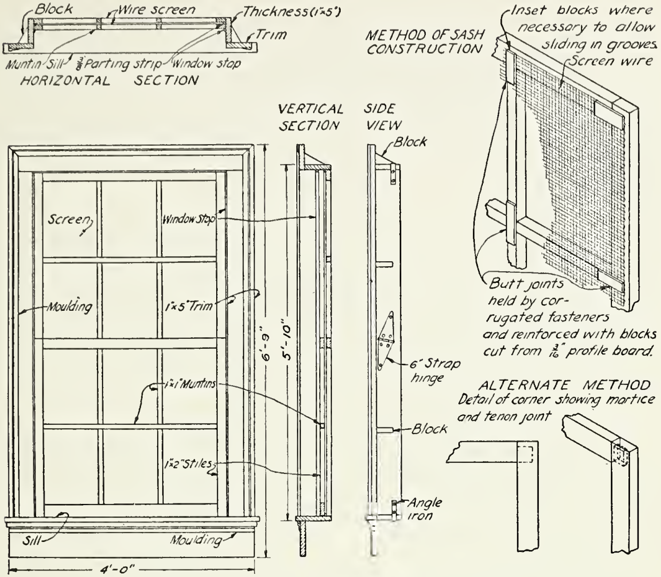

Block
Wire screen
Thickness (1"×5")
Trim
Muntin
Sill
⅜ Parting strip
Window stop
HORIZONTAL SECTION
METHOD OF SASH CONSTRUCTION
Inset blocks where necessary to allow sliding in grooves
Screen wire
VERTICAL SECTION
SIDE VIEW
Block
Screen
Window Stop
Moulding
1"×5" Trim
6'-9"
5'-10"
1"×1" Muntins
1"×2" Stiles
Sill
Moulding
4'-0"
6" Strap hinge
Block
Angle iron
Butt joints held by corrugated fasteners and reinforced with blocks cut from 3/16" profile board.
ALTERNATE METHOD
Detail of corner showing martice and tenon joint

FIG. 23. A WINDOW FRAME UNIT

Front and side elevations, plan, and section of a double-hung window. Scale ⅜" = 1'–0".

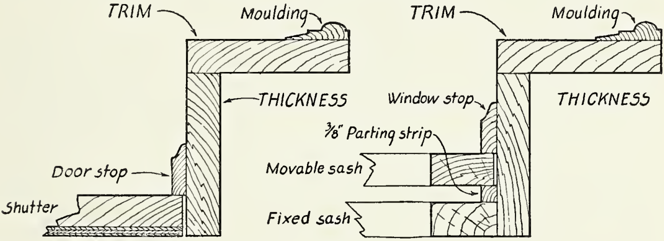

TRIM
Moulding
THICKNESS
Door stop
Shutter
TRIM
Moulding
Window stop
THICKNESS
⅜" Parting strip
Movable sash
Fixed sash

FIG. 24. DOOR AND WINDOW CASINGS

A comparison of the two jambs in cross section. Scale 2" = 1'–0".

The design of the flat which holds the double-hung type of window is indicated in Fig. 20.

10. *Fireplaces*

A fireplace is constructed by nailing or screwing profile board over a light framework of 1″ x 3″ battens (Fig. 25). After a mantel cut from 1″ x 8″ or 10″ stock is fastened in place, the unit is dressed up with molding and any additional woodwork desired.

The fireplace is used with a flat cut for it (Fig. 20). If the fireplace is of the type that extends out a few inches from the wall, it will stand safely by itself, especially if its bottom is given a slight rake to incline it to lean backwards. If it is of the other type, however, such as the one pictured, it is safer to construct it with a 6″ permanent thickness, and to mount on the outer sides of this two 6″ strap hinges, to clamp the frame into the flat in the same manner as that employed for door and window frames (Fig. 22).

A small three-fold screen daubed with gray and black serves as a backing for the opening. If the thickness described above is used, it must be painted to match the screen.

11. *Ceilings*

In old-fashioned interiors the space above the wings or flats was masked by a series of vertical cloth strips called "borders." Modern practice, however, uses the more realistic ceiling piece to close in the set above. Attached to two or three sets of lines, it is raised and lowered horizontally.

The more common type for small stages is the "roll ceiling" (Fig. 26). Its construction is simple. A large sheet of canvas, made by sewing together several widths, with seams running lengthwise, is tacked and glued to two long 1″ by 4″ battens, one at the up stage edge and one at the down. If the ceiling is to be of any length —over 20′-0″, say—each of these battens may be made of two shorter lengths spliced together with a scarf splice (Fig. 14). Three or more 1″ by 3″ battens, called "stretchers," cut the width of the ceiling minus 8″ (the combined width of the two longitudi-

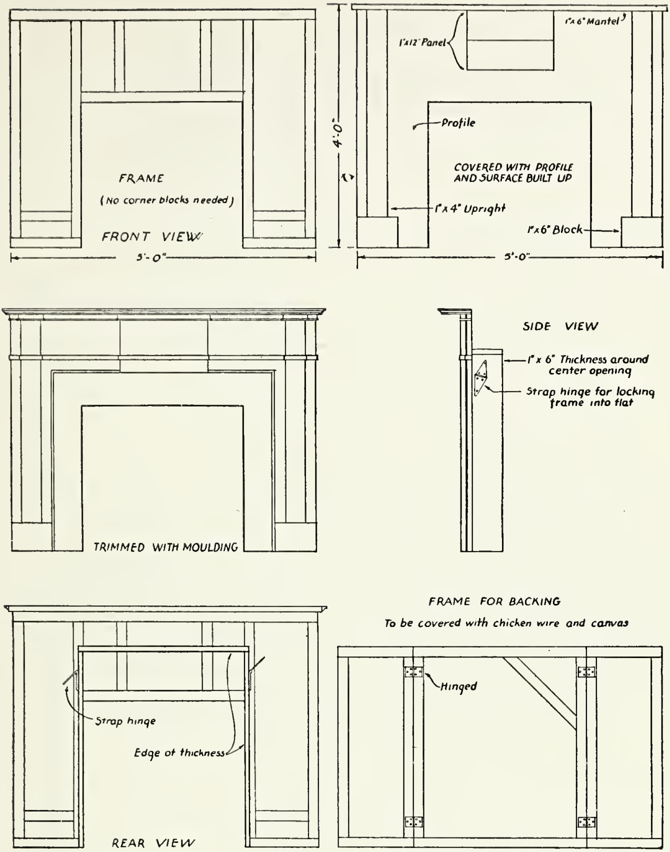

FRAME
(No corner blocks needed)
FRONT VIEW
5'-0"
4'-0"
1"x12" Panel
1"x6" Mantel
Profile
COVERED WITH PROFILE AND SURFACE BUILT UP
1"x4" Upright
1"x6" Block
5'-0"
TRIMMED WITH MOULDING
SIDE VIEW
1"x 6" Thickness around center opening
Strap hinge for locking frame into flat
FRAME FOR BACKING
To be covered with chicken wire and canvas
Hinged
Strap hinge
Edge of thickness
REAR VIEW

FIG. 25. A FIREPLACE UNIT

Showing the method of building it up from a flat frame. Also a hinged backing. Scale 3/8" = 1'-0".

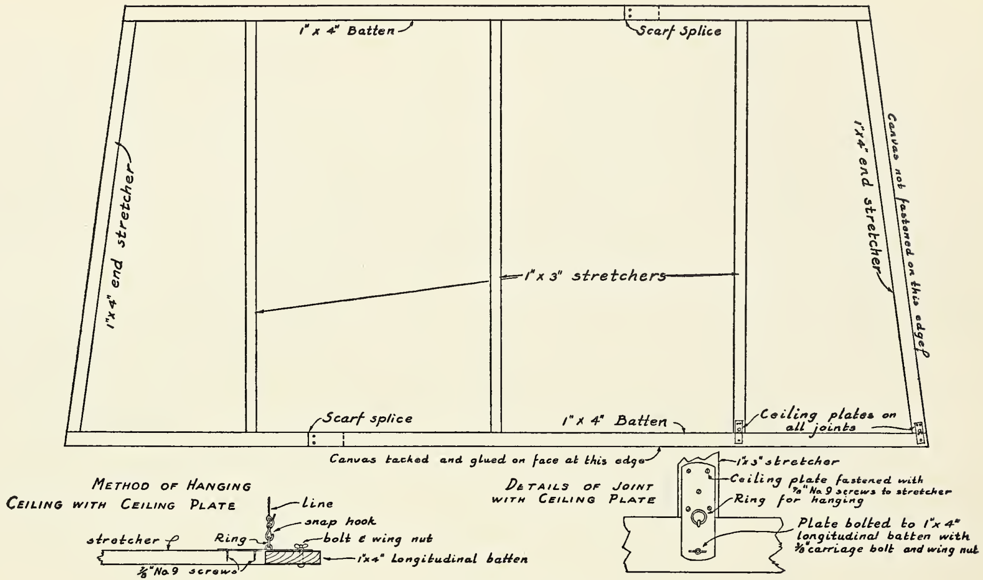

1" x 4" Batten
Scarf Splice
1"x4" end stretcher
1"x 3" stretchers
1"x4" end stretcher
Canvas not fastened on this edge
Scarf splice
1" x 4" Batten
Ceiling plates on all joints
Canvas tacked and glued on face at this edge
METHOD OF HANGING CEILING WITH CEILING PLATE
Line
snap hook
stretcher
Ring
bolt & wing nut
1"x4" Longitudinal batten
⅞"No 9 screws
DETAILS OF JOINT WITH CEILING PLATE
1"x3" stretcher
Ceiling plate fastened with ⅞" No 9 screws to stretcher
Ring for hanging
Plate bolted to 1"x 4" longitudinal batten with ⅜" carriage bolt and wing nut

FIG. 26. A ROLL CEILING

Plan, looking down from above. When the stretchers are removed this type of ceiling may be rolled up on the longitudinal battens. Very large or heavy ceilings may be braced on the back with two 1″ x 3″ stiffeners fastened to the stretchers by means of loose-pin hinges. Scale ¼″ = 1′–0″.

nal battens), are laid across between the longitudinal battens and bolted to them. A ceiling plate, one half of which is attached to an end of each stretcher by means of ⅞″ No. 9 screws (reinforced with 3⁄16″ stove bolts if the ceiling is heavy), laps the edge of the longitudinal batten and is fastened to the latter by a ⅜″ carriage bolt, which passes through a hole in the wood and is drawn up tight with a wing nut above the plate. Stretchers are not attached to the canvas. Therefore, they should be long enough to make a snug fit, and so prevent a sag in the cloth. The outer edge of this canvas at the sides can be fastened temporarily to the last two stretchers by a few tacks driven in part way.

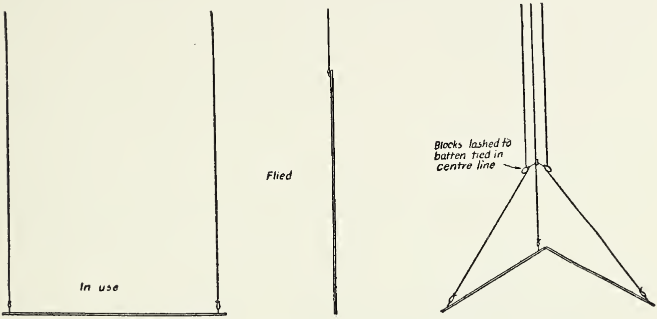


FIG. 27. METHODS OF HANGING ROLL AND BOOK CEILINGS

The methods by which they are hung and flied. Side elevation.

If the ceiling is very wide, two stiffeners (1″ x 3″ battens on edge) may be pin-hinged across the stretchers to prevent sagging.

To fly the ceiling, two sets of lines with snap hooks are lowered and attached to rings in the plates. When the frame is in use, it is handled in a horizontal position. When it is not in use, one set of lines is detached and it is flied out of the way vertically like a drop. When the ceiling is to be dismantled and stored away, it is lowered, the stretchers are removed, and the canvas is rolled up on the two long battens.

Three virtues which should be found in every good ceiling are lightness, tautness, and size sufficient to cover the whole set (except the backings) comfortably.

12. *Drops and Borders*

Drops (Fig. 28) should, if possible, be made of good duck or linen canvas, not muslin, because the material must be strong enough to support itself without the aid of a frame. To prevent wrinkling in hanging, seam the cloth horizontally. Use single straight seams and keep all the selvage edges on the back. Tack the cloth between double 1″ x 3″ or 4″ battens at the top and bottom, taking great care to avoid puckers. The battens are fastened together with 1¾″ No. 9 screws. If the wood strips are not long enough to reach the full width of the drop, they may be spliced with the usual scarf splice, or an over-lap splice (Fig. 14).

If a drop is cut, it should be backed by a large piece of netting or scrim (depending upon whether a clear or a misty effect is desired). The netting should extend over the entire open space and support the free branches and bits of foliage (or whatever the elements represent) that compose the silhouette. To attach the netting, turn the drop on its face and glue the netting to the back of the drop with some flexible adhesive agent. "Rosine," a preparation which is made especially for this purpose and can be secured from any stage hardware company, is generally employed. It is melted for use in the double boiler manner described in the section on "Covering" (Sect. 5), and applied with a brush. Some of the cold water pastes are fair substitutes. Whatever the agent is, it should be flexible enough not to crack when the drop is rolled. If the netting used is of the large-mesh variety, it will be necessary to attach it to the drop by gluing little strips of cloth over the areas to be fastened.

The *border* is made in the form of a shallow drop, commonly of only one width of 72″ canvas, with no battens at the bottom. Except as an occasional foliage or masking piece, the border is not used very much now and its name is often appropriated for other service. On a modern stage the simple term "border" is commonly used to refer to a striplight or row of spotlights hanging on a pipe

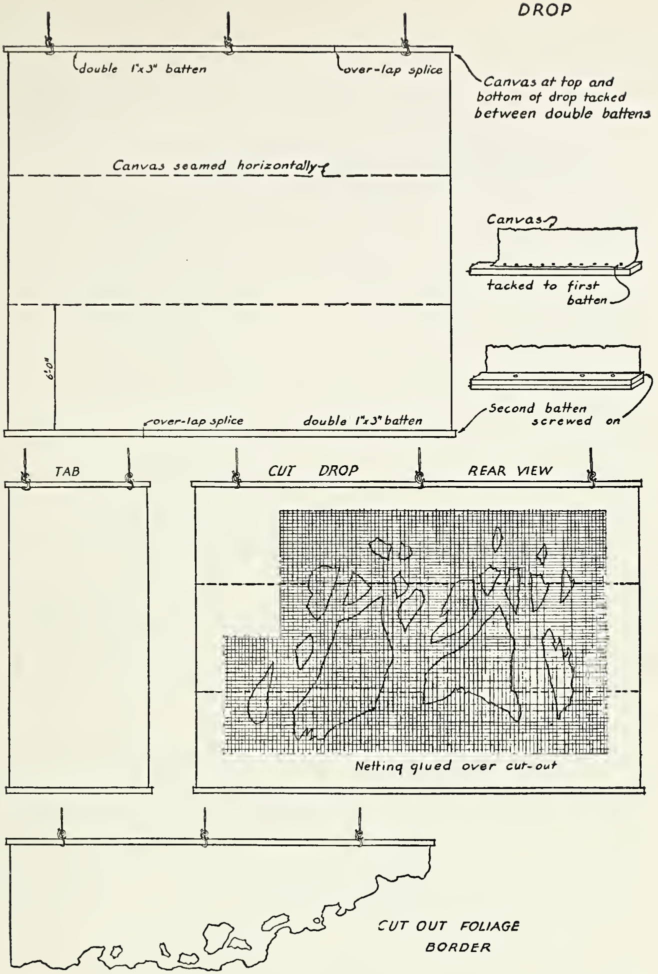

DROP
double 1"x3" batten
over-lap splice
Canvas at top and bottom of drop tacked between double battens
Canvas seamed horizontally
Canvas
tacked to first batten
6'-0"
Second batten screwed on
over-lap splice
double 1"x3" batten
TAB
CUT DROP
REAR VIEW
Netting glued over cut-out
CUT OUT FOLIAGE BORDER

FIG. 28. PLAIN AND CUT DROPS, A CUT BORDER AND A TAB

The units shown here are considerably smaller in scale than those generally in use on the professional stage. Scale ⅛″ = 1′–0″.

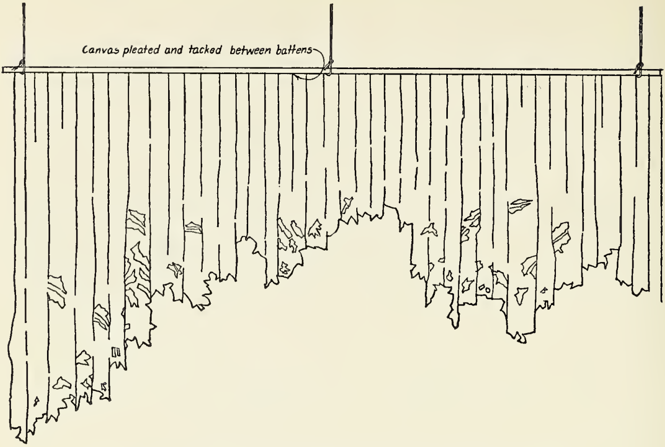


FIG. 29. A CUT AND PLEATED FOLIAGE BORDER

Interesting effects can be secured with this type of foliage piece by draping one or both ends of the canvas. Scale ⅛″ = 1′–0″.

batten overhead (Part Three, Chap. III, Sect. 3). To distinguish it, the canvas border is now commonly called a "cloth border."

The *tab* is made in the form of a narrow drop or border.

Drops, borders and tabs are flied by attaching sets of lines to their upper battens (Chap. IV, Sects. 5–6).

13. *Cycloramas*

Cycloramas, or "cycs," are made of a variety of cloth materials hung from U-shaped wood or metal frames. They are commonly wide enough to reach well beyond the tormentors into each wing, and generally high enough to require no masking above, other than that offered by the teaser and perhaps a border. Made in several different forms, they serve a number of purposes.

The most common form is the drapery or curtain cyclorama (Fig. 30). The cloth material, usually a dyed fabric with a surface texture that takes stage lighting well—such as velvet, flannel, poplin, monk's cloth, silk, satin, or duvetyne—is put together in

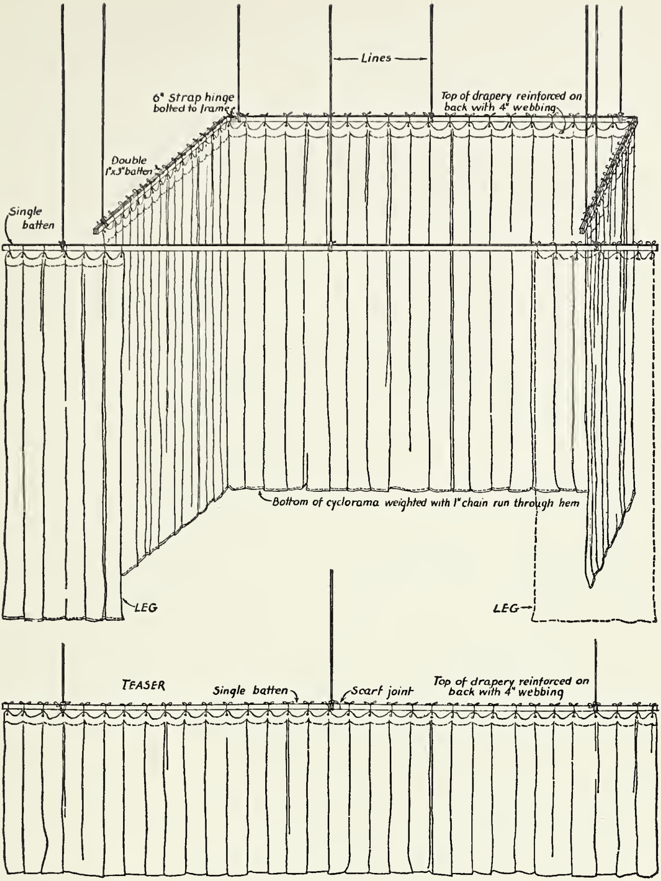

Lines
6" Strap hinge bolted to frame
Top of drapery reinforced on back with 4" webbing
Double 1"x3" batten
Single batten
Bottom of cyclorama weighted with 1" chain run through hem
LEG
LEG
TEASER
Single batten
Scarf joint
Top of drapery reinforced on back with 4" webbing

FIG. 30. A SMALL DRAPERY CYCLORAMA WITH TWO LEGS AND A TEASER

Scale ⅛″ = 1′–0″.

vertical seams, reinforced with a strip of webbing at the top, and tied to the "cyc" frame by short cords which pass through grommeted holes along the webbed edge of the cloth. The grommets are placed 6″ to 12″ apart.

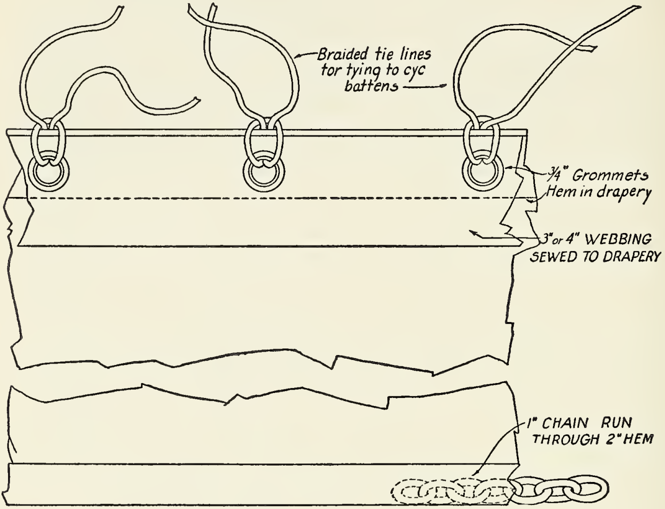

Braided tie lines for tying to cyc battens
3/4" Grommets
Hem in drapery
3" or 4" WEBBING SEWED TO DRAPERY
1" CHAIN RUN THROUGH 2" HEM

FIG. 31. THE METHODS OF REINFORCING THE TOP AND WEIGHTING THE BOTTOM OF CYCLORAMA DRAPES

The frame itself is commonly made of three 1″ x 4″ battens, single or double, depending on the reach and the weight of the draperies. A long batten supports the material at the rear, and two shorter ones, the "arms," pivoted to its ends with 5″ to 8″ strap hinges, carry the material down stage and off.

As draperies are nearly always hung in folds, sufficient material must be ordered to allow for the gathering ("fullness")—generally twice the total width of the cyclorama. The bottom should be weighted with about 1″ chain run through a strong hem.

If the down-stage edges of a cyclorama cannot be masked by the tormentors or other pieces of scenery, use may be made of two "legs" (tabs) hung in front of the edges of the cyc, parallel to the tormentors (Fig. 30).

14. *Platforms*

A platform (Fig. 32) must be light and collapsible, but strong enough to support safely the maximum weight for which it is intended. If it is to be large, it is put together in a number of smaller, more portable parts, which may be assembled quickly in a performance to form the larger structure.

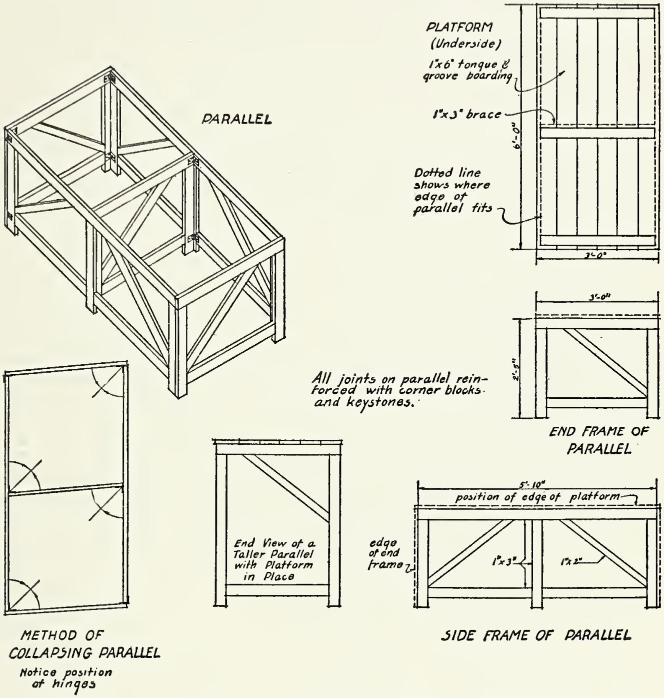

PLATFORM
(Underside)
1"x6" tongue & groove boarding
1"x3" brace
6'-0"
Dotted line shows where edge of parallel fits
3'-0"
PARALLEL
3'-0"
2'-5"
All joints on parallel reinforced with corner blocks and keystones.
END FRAME OF PARALLEL
5'-10"
position of edge of platform
edge of end frame
1"x3"
1"x2"
End View of a Taller Parallel with Platform in Place
SIDE FRAME OF PARALLEL
METHOD OF COLLAPSING PARALLEL
Notice position of hinges

FIG. 32. A PLATFORM UNIT

Scale ¼″ = 1′–0″.

In unit form a platform consists of two parts: a *platform top,* the floor piece on which actors stand and walk; and a parallel, the light, folding trestle which supports this. The construction of the parallel is illustrated in the drawing. Each of the five sections is made out of 1″ x 3″ white pine strips, cut and put together in the pattern shown. The parts are butt jointed, fastened with ¾″ No. 5 corrugated fasteners, and reinforced with the usual corner blocks. Each frame is made rigid by a diagonal 1″ x 2″ brace in its upper right-hand corner.

The five sections are fastened together with 2″ back-flaps, secured with ⅞″ No. 9 screws, two hinges being placed at each corner. The two end sections overlap the edges of the side sections, in order to make square outside corners. With this arrangement it is important that the hinges be placed as shown, otherwise the parallel will not fold. It should close one way only.

The platform top is made of 1″ x 6″ tongue-and-groove boards held together by 1″ x 3″ cross braces fastened with 1½″ No. 9 screws. As the cross braces must fit inside the edge of the parallel, they should be cut so that they will be an inch shorter at each end than the width of the platform. Care must also be taken to see that the center brace clears the edge of the middle section of the parallel.

If one or more sides of a platform are to be in view of the audience, the visible face, or faces, of the parallel may be covered with profile board. This should be attached in such a way as not to interfere with the folding of the parallel.

The inclined platform, or runway, called a *ramp,* is constructed similarly to the platform just described.

15. *Steps and Stairs*

The principal parts of a simple flight of stairs are the *stringers,* the parallel planks which support the steps; the *treads,* the horizontal boards that form the steps; and the *risers,* the vertical boards that connect the treads.

Figure 33 shows a common method of construction. Each step is made by nailing a 1″ x 8″ to 12″ tread across two or more

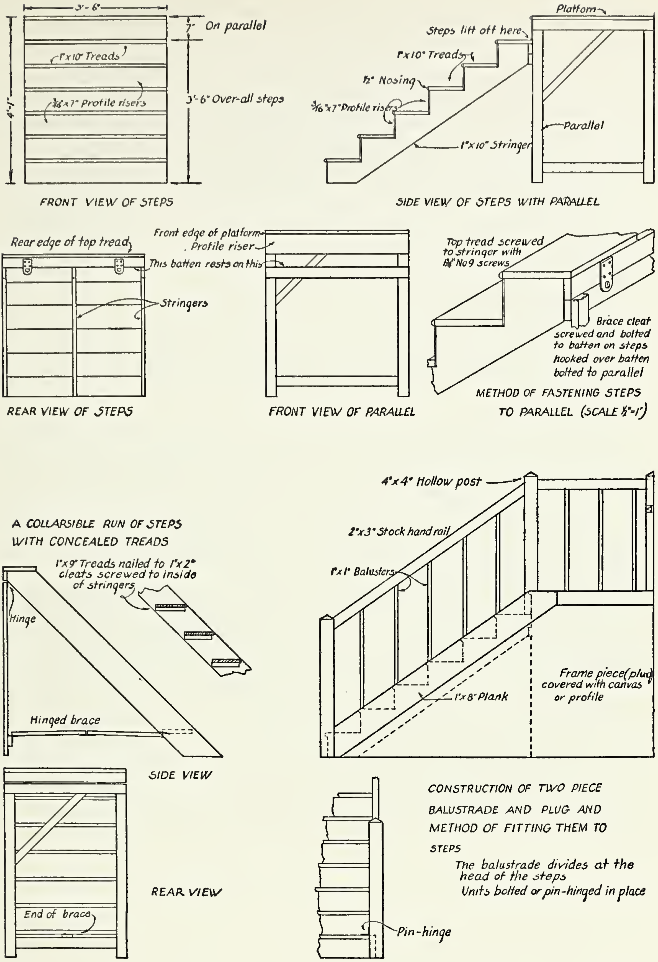

3'-6"
4'-1"
7" On parallel
1"x10" Treads
⅜x7" Profile risers
3'-6" Over-all steps
FRONT VIEW OF STEPS
Platform
Steps lift off here
1"x10" Treads
½" Nosing
³⁄₁₆"x7" Profile risers
1"x10" Stringer
Parallel
SIDE VIEW OF STEPS WITH PARALLEL
Rear edge of top tread
Front edge of platform
Profile riser
This batten rests on this
Stringers
REAR VIEW OF STEPS
FRONT VIEW OF PARALLEL
Top tread screwed to stringer with 1¼" No 9 screws
Brace cleat screwed and bolted to batten on steps hooked over batten bolted to parallel
METHOD OF FASTENING STEPS TO PARALLEL (SCALE ½"=1')
A COLLAPSIBLE RUN OF STEPS WITH CONCEALED TREADS
1"x9" Treads nailed to 1"x2" cleats screwed to inside of stringers
Hinge
Hinged brace
SIDE VIEW
End of brace
REAR VIEW
4"x4" Hollow post
2"x3" Stock hand rail
1"x1" Balusters
1"x8" Plank
Frame piece (plug) covered with canvas or profile
Pin-hinge
CONSTRUCTION OF TWO PIECE BALUSTRADE AND PLUG AND METHOD OF FITTING THEM TO STEPS
The balustrade divides at the head of the steps
Units bolted or pin-hinged in place

FIG. 33. STEPS

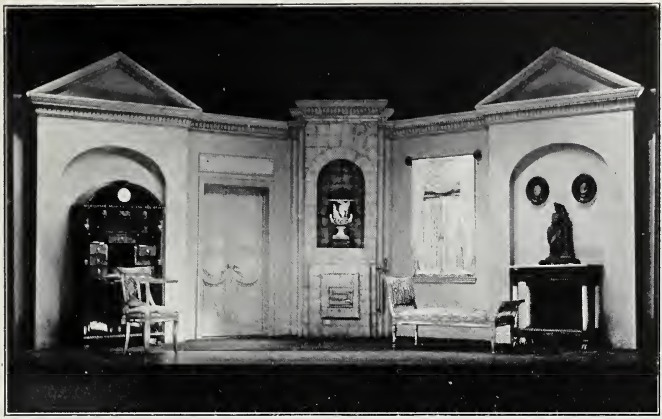
Stationary and collapsible runs of steps, a balustrade and a plug. Scale ¼" = 1'–0".

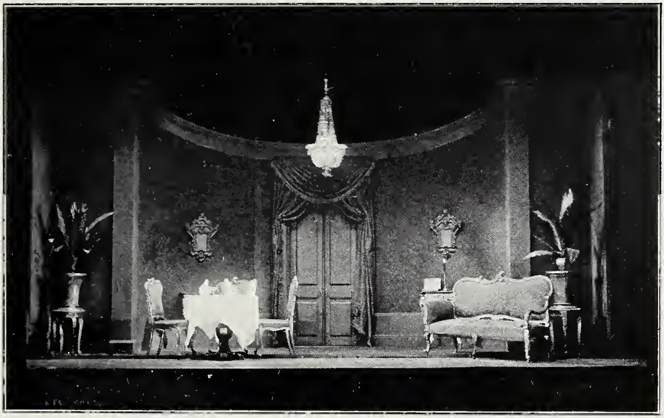
stringers cut from 1″ x 10″ stock, in such a way as to allow about an inch of the front edge of the tread to overhang the step below. If the step is over 30″ wide, one or more additional stringers are placed between the outside two. Risers, because they are required to bear no weight, are made of ³⁄₁₆″ profile. There is no absolute standard for dimensions of steps. Their height and depth depends on the pitch required of a flight of steps. The amount of 17″ is frequently employed, however, as a standard over-all measurement of a tread and its adjacent riser; that is, if the tread is to be 12″ deep, the riser will be 5″ high, if the tread is to be 9″ deep, the riser will be 8″ high, and so on.

A flight of stairs, unless it is supported independently, is made to fasten to the platform to which it leads. A 1″ x 4″ batten is fastened with 1¾″ No. 9 screws across the stringers at the top, under the rear edge of the last tread, and a similar batten is placed just below its level on the parallel. A couple of brace cleats are screwed to the first batten. To attach the stairs to the platform, the head of the former is lifted and the cleats on the batten across the stringers are slipped over the batten on the parallel. In this position, one batten rests on top of the other. The cleats prevent them from slipping apart. The parallel should be well anchored with stage braces to prevent it from tipping over.

If a long flight of steps is to be constructed, it is planned as a number of unit runs and parallels. When assembled, they are fastened together by 2″ loose-pin hinges or ⅜″ carriage bolts (Sect. 6). Balustrades, also, are made separately, attached to the edge of 1″ x 10″ planks and fastened to the flight of steps with similar hardware. When the side of a staircase is in view of the audience, the entire construction work may be concealed by a triangular flat ("plug") fastened by loose-pin hinges to the face of the staircase.

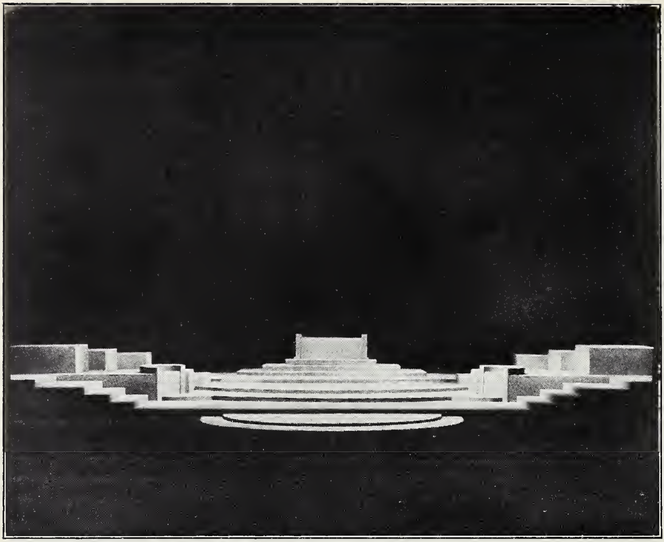
A narrow stairway which does not have to reveal its steps from the side may be built without cut stringers. The treads are merely nailed to cleats screwed to the inside of the straight stringers. A small, portable unit, constructed on this plan, is illustrated in the drawing.





Vandamm

Realism simplified and made decorative in modern stage design. Two of Jo Mielziner's settings in a recent production of Schnitzler's *Anatol*.



Antigone as produced by Frederic McConnell at the Cleveland Play House. The scene was designed by Arch Lauterer.

Steps should be covered with canvas before being painted (Sect. 5).

16. *Columns*

A column (Fig. 34) is constructed by nailing wide sheets of ⅛″ profile around a light cylindrical frame. Wooden discs or rings, each made up of several pieces of 1″ x 6″ to 10″ stock fastened together with corrugated fasteners, form the core of the column. They are spaced at intervals equal to the width of the profile sheets and held in place by 1″ x 2″ strips running the length of the unit. The profile strips are wrapped around this core and nailed to the edges of the discs, or rings, as well as seamed along the strips. The column viewed from one side only needs but one good face. In fact, small columns are often made in half, that is, around half discs, called "half-rounds." This type of column, if it is not held erect by some other structure above, is secured by a brace cleat and stage brace fastened on the blind side. The column should be covered with canvas before it is painted (Sect. 5).

Columns are frequently constructed also in the form of simple canvas cylinders stretched between solid bases, weighted at the floor, and wooden discs or frames attached to ropes in the flies. Cloth columns are practicable only, of course, in positions where actors are not likely to lean or brush against them.

17. *Tree Trunks and Foliage*

The construction of a "solid" tree trunk (Fig. 34) involves the same principles as those employed in the building of a column, except that a more irregular "core" is used, and chicken wire and canvas are employed instead of profile. Additional irregularities, such as knots and excrescences, are built up on the half-cylindrical frame, and then chicken wire is tacked over the whole structure with ½″ staples. Small pieces of scrap canvas are dipped into the hot glue and whiting preparation described in Section 5, and pasted, with their edges lapping, in irregular patterns over the wire. When this dries, it gives a hard, uneven surface for painting a sugges-

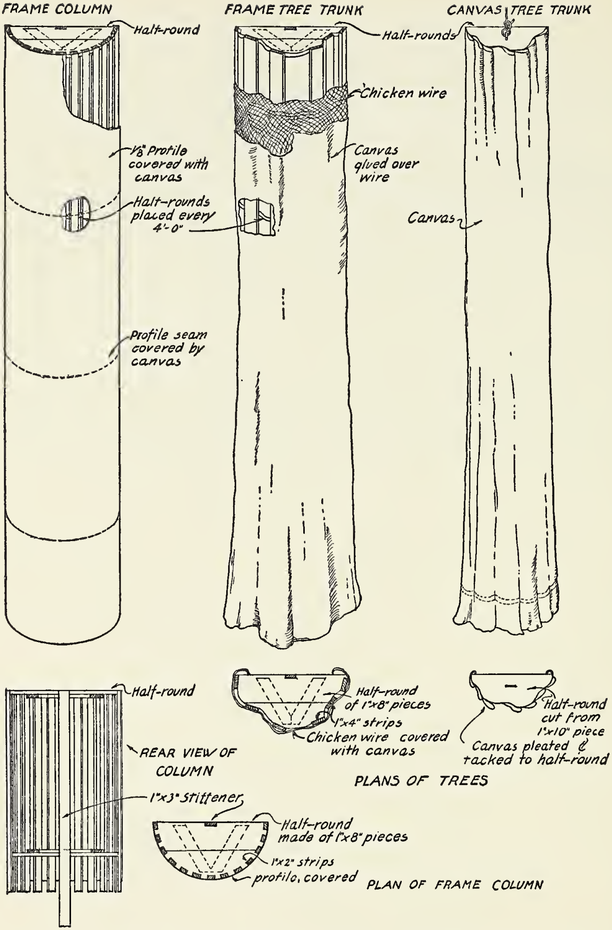

FRAME COLUMN
Half-round
1/8" Profile covered with canvas
Half-rounds placed every 4'-0"
Profile seam covered by canvas
FRAME TREE TRUNK
Half-rounds
Chicken wire
Canvas glued over wire
CANVAS TREE TRUNK
Canvas
Half-round
REAR VIEW OF COLUMN
1"x3" Stiffener
Half-round of 1"x8" pieces
1"x4" strips
Chicken wire covered with canvas
Half-round cut from 1"x10" piece
Canvas pleated & tacked to half-round
PLANS OF TREES
Half-round made of 1"x8" pieces
1"x2" strips
profile, covered
PLAN OF FRAME COLUMN

Fig. 34. A Frame Column, and a Frame and a Collapsible Tree Trunk
Scale ¼″ = 1′–0″.

tion of bark. This type of trunk is held erect by the use of a brace cleat and a stage brace on the up-stage side.

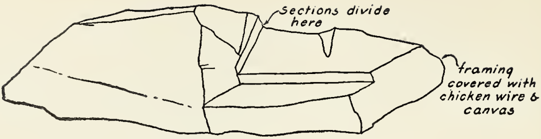
If the tree trunk called for in the design occupies a position on the stage where the audience cannot scrutinize it too closely and where no actor will brush against it, it is possible to substitute a much more easily built collapsible form for the rather elaborate framed kind described above. A wide strip of canvas is tacked in irregular pleats around notched discs at the top and bottom and hung by means of a screw eye to a line in the flies. The forest scenes in the original Provincetown Players' production of *Emperor Jones* were composed of such trees grouped on wires in front of cut-out drops (see Fig. 11).

Realistic foliage is very difficult to create on the stage, except in expensive ways, and modern scenic artists consequently avoid its use as much as possible. Showing the lower portions of several realistic tree trunks in the foreground, they attempt merely to suggest masses of leaves and shrubbery in the background by using well shadowed cut-out drops kept discreetly behind much scrim. Where foliage must be shown down stage, they use cut-out cloth borders hung in silhouette, as far as possible. The canvas is frequently gathered or draped, after it is cut, to add to the depth of the foliage (Fig. 29). The effect secured, especially in fairly dim scenes, is sometimes quite realistic.

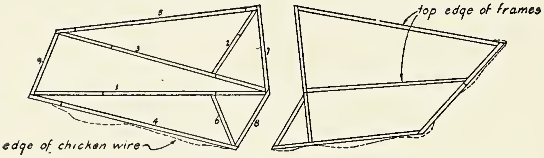
Bushes and smaller shrubbery units may be constructed out of actual branches or sticks wired together and shaped up with papier mâché according to the artist's design. To this skeleton are attached, by means of short lengths of fine wire, foliage pieces secured from an artificial flower concern, or leaf and blossom forms cut from glue-stiffened cloth or crêpe paper. The bush is then painted.

18. *Rocks and Built-up Ground*

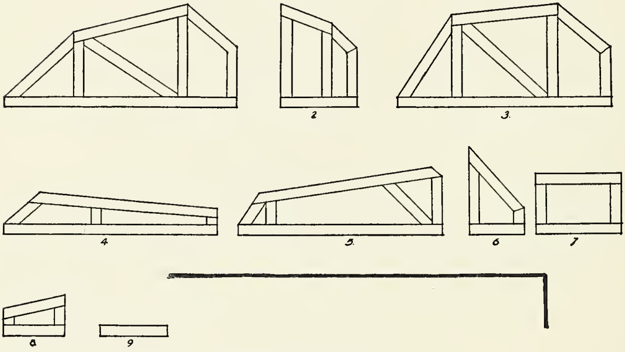
Rocks and built-up ground (Fig. 35) are made by covering light, irregular frames of 1″ x 3″ stock with chicken wire tacked down with ½″ staples, and covering the wire, in turn, with small pieces of canvas dipped in a mixture of hot glue and whiting, in


Sections divide here
framing covered with chicken wire & canvas

ROCK


8
3
2
7
9
1
4
6
8
edge of chicken wire
top edge of frames

PLAN OF FRAMES · 2 SECTIONS



FRAME ELEVATIONS
OF LEFT SECTION OF ROCK

Fig. 35. A Frame Rock

In two sections. Scale ¼″ = 1′–0″.

much the same way as tree trunks are built. If the rock or ground is to be walked on, care must be taken to make the framework strong and rigid. The standard method for building a "practical" rock is to start with a number of vertical three- or four-sided frames, similar (except that these are irregular) to the sections of a parallel (Sect. 14). They are of different heights, some straight, some inclined, and some pointed. Placed edge to edge and edge to side, lengthwise and across, they are fastened together with 1¾″ No. 9 screws or long nails. In the parts of the rock that must be practical, additional battens are nailed at short intervals between sections, and these are covered with pieces of planking arranged in different planes. If the rock is large, it should be made in a number of smaller units pin-hinged, or bolted together. Tufts and folds of brown burlap or felt attached to the surface here and there may be made to suggest patches of earth and knots of grass.

19. *Ground Rows*

Ground rows, and other silhouette pieces, representing distant mountain ranges, clumps of bushes, and the like (Fig. 36), are made by nailing 3⁄16″ profile over flat frames of 1″ x 3″ stock,

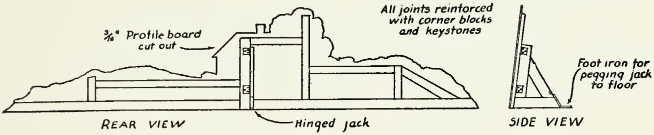

3⁄16" Profile board cut out
All joints reinforced with corner blocks and keystones
Foot iron for pegging jack to floor
REAR VIEW
Hinged jack
SIDE VIEW

FIG. 36. A GROUND ROW

Rear and side elevations. Scale ¼″ = 1′–0″.

which are put together with corrugated fasteners and reinforced with corner blocks in the usual way (Sect. 4). The silhouettes are then painted and the outlines are finally cut out with a compass saw. The unit is made to stand up by the hinging of a triangular brace, called a "jack," to its back. Small units may use a large angle iron in place of the jack.

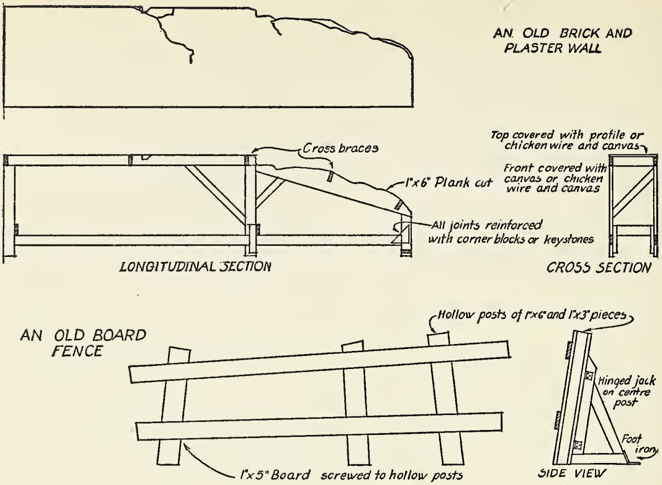

AN OLD BRICK AND PLASTER WALL
Cross braces
Top covered with profile or chicken wire and canvas
Front covered with canvas or chicken wire and canvas
1"x6" Plank cut
All joints reinforced with corner blocks or keystones
LONGITUDINAL SECTION
CROSS SECTION
AN OLD BOARD FENCE
Hollow posts of 1"x6" and 1"x3" pieces
Hinged jack on centre post
Foot iron
1"x5" Board screwed to hollow posts
SIDE VIEW

FIG. 37. A SET WALL AND FENCE

Scale ¼″ = 1′–0″.

CHAPTER IV

THE ASSEMBLING AND SHIFTING OF SCENERY

1. *The Stage Machine*

To design a stage for the most efficient handling of present-day scenery requires the best knowledge of an engineer. The stage must be nicely proportioned and carefully organized in order to give a maximum of mechanical service in a minimum of space. No more complex in structure than some of its predecessors, frequently not so much so, the modern stage is considerably better planned for economy and flexibility than the older ones. The degree to which it may be called "modern" clearly does not depend upon its size and complexity nor the number of scene-shifting "tricks" it can boast. It depends on something more significant —its adaptability to the specific technical needs of each new play. Over-elaborate machinery is apt to defeat its own purpose and become a hindrance rather than a help. Flexibility and expansiveness are the first two essentials of good equipment.

In the following sections are described some of the more common methods of assembling and shifting scenery on the adaptable type of stage.

2. *The Lashing and Bracing of Scenery*

Two flats placed edge to edge are bound together by means of a system of "lashing" (Figs. 17 and 38) described in Chapter III, Section 6. The lash line, attached to the right upper corner of the flat on the left as one faces the back of the scenery, is grasped with the right hand, tossed up and over the left upper lash cleat on the flat on the right, back over a cleat on the first flat, and so on down to the last cleat on the right flat. It is carried over this cleat, around the cleat opposite it on the left, and back to the right. The free end of the line is now passed under the prostrate portion and pulled down snugly to tighten the lashing. While the left hand holds the rope taut, near the bend, the right hand lifts the free end and passes a loop of it under the prostrate portion once more to tie a slip knot. To loosen the lashing, it is necessary only to pull the free end of the line.

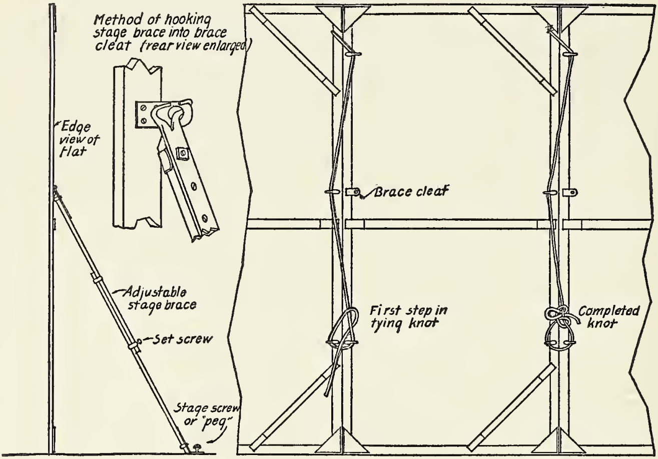

Method of hooking stage brace into brace cleat (rear view enlarged)
Edge view of flat
Adjustable stage brace
Set screw
Stage screw or "peg"
Brace cleat
First step in tying knot
Completed knot

FIG. 38. THE METHODS OF LASHING AND BRACING SCENERY

See Fig. 22. Scale ¼″ = 1′–0″.

Flats needing special support, such as those on the edge of a set, in the center of a long straight wall, or holding doors or windows, are made secure by being propped from behind with stage braces. In each position where this is necessary the brace (made of two lengths of 1″ x 1″ wood held between clamps, and fitted at one end with a forked iron hook, and at the other with an iron heel) is hooked into a brace cleat placed on any convenient part of the flat 7′-0″ or more from the floor; it is twisted so that its prongs clinch the plate as shown in the enlarged detail in Figure 38; and then it is pegged firmly to the floor with a stage screw.

The brace, which may be extended open to about twice its length when closed, is held at the proper adjustment by means of a set screw placed in one of the clamps. Stage braces can be ordered from J. R. Clancy, Inc., his agents, or any other firm dealing in theatrical hardware. (See addresses of Dealers and Manufacturers of Stage Equipment at the end of the book.)

3. *The Bolting and Hinging of Scenery*

Heavier units, demanding strength, such as stairs, platforms and other built-up pieces, and certain lighter units which cannot be conveniently lashed, are fastened together by means of carriage bolts and wing nuts, or loose-pin back flaps and wire pins. The methods of using this attachment hardware are described in Chapter III, Section 6, and under the construction of the various units which usually require them. On pieces of scenery which have to be put together or taken apart quickly the bolts or hinges must not only be securely attached but be in readily accessible places.

4. *The Gridiron and the Fly Floor*

In order to fly scenery it is necessary to have some arrangement for hanging ropes. Every well-equipped stage has a gridiron (Chap. II, Sect. 1) which extends over the entire working space and is built high enough to permit drops to be lifted completely out of view of the audience (Figs. 39 and 40). The fly space on some professional stages reaches over 100 feet above the floor. The grid itself is constructed as a skeleton framework of steel I-beams, or wood beams, which is supported by the side walls and often vertical hangers from the roof. It is covered with an open lattice-work of steel strips, and is slotted from front to back at regular intervals to accommodate the fly ropes. The slots are commonly placed about 12′-0″ to 15′-0″ apart. A narrow stage will have four slots, a wider one six or more. Above each of these slots, except one, are bolted large steel protected sheaves called *loft blocks;* while above the last slot, situated directly over the fly gallery, are set up multiple sheave frames called *head blocks.*

Each set of blocks on an average-sized stage (with a proscenium

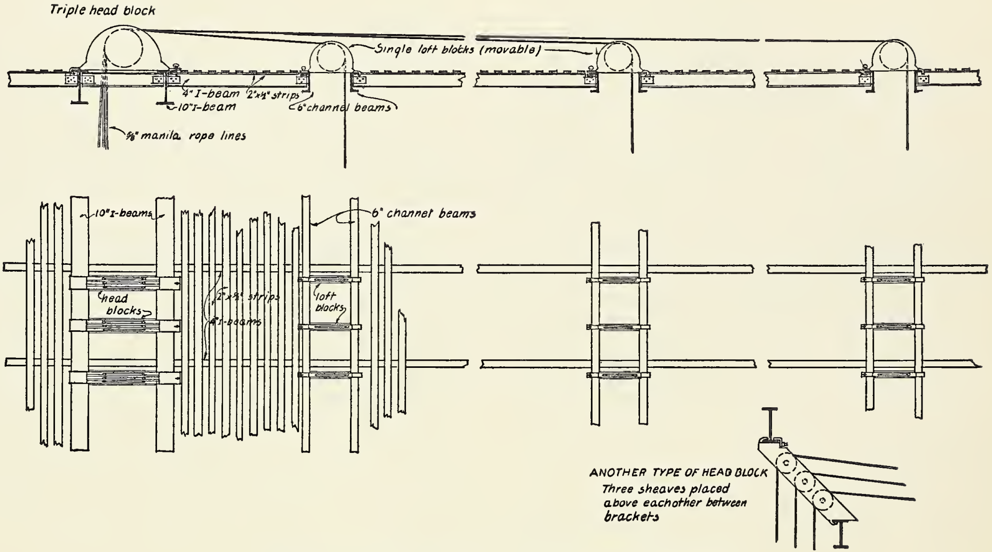

Triple head block
Single loft blocks (movable)
4" I-beam
2"x⅝" strips
10"I-beam
6"channel beams
⅝" manila rope lines
10"I-beams
6" channel beams
head blocks
2"x⅝" strips
4"I-beams
loft blocks
ANOTHER TYPE OF HEAD BLOCK
Three sheaves placed above eachother between brackets

Fig. 39. The Construction of the Gridiron

Section and plan. Scale ¼″ = 1′–0″.

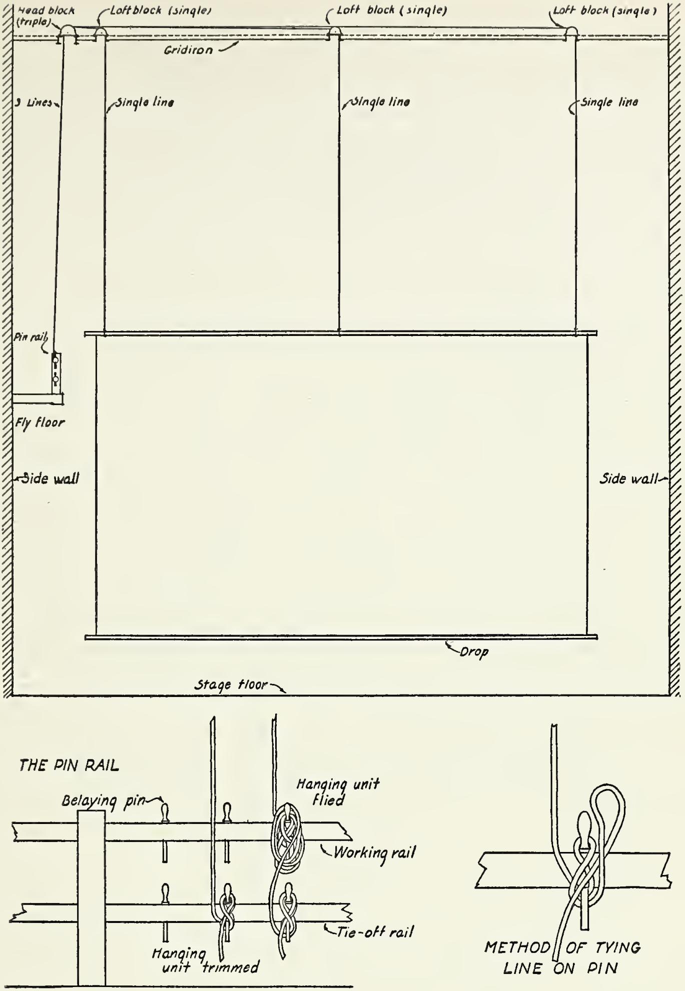

Head block (triple)
Loft block (single)
Loft block (single)
Loft block (single)
Gridiron
3 Lines
Single line
Single line
Single line
Pin rail
Fly floor
Side wall
Side wall
Drop
Stage floor
THE PIN RAIL
Belaying pin
Hanging unit flied
Working rail
Tie-off rail
Hanging unit trimmed
METHOD OF TYING LINE ON PIN

Fig. 40. The Machinery for Flying Scenery

A general view of the gridiron and the fly floor, looking toward the rear wall of the stage (scale 1/16″ = 1′–0″) and a detailed study of the pin rail on the fly floor, showing the method of tying lines (scale 1/4″ = 1′–0″).

opening, say, 25′-0″ to 30′-0″ wide), generally consists of three loft blocks [1] and one head block arranged in a row at right angles to the slots and parallel to the proscenium wall. A *set of lines,* made up of ½″ to ⅝″ manila ropes (depending on the maximum load to be provided for), is attached to the center and the two ends of a hanging piece of scenery, passed over the three loft blocks directly above and the common head block at the side, then brought down and tied off on the row of belaying pins, the *pin rail,* on the *fly floor* (Chap. II, Sect. 1 and Fig. 40).

The fly floor, from which all the fly ropes are controlled, is a narrow floor, sturdily constructed, placed along one of the side walls of the stage, between the proscenium wall and the rear wall, some distance from the floor. It is situated high enough to clear all standing scenery—frequently 20′-0″ or more feet up—but not so high as to interfere with the free movement of counterweights (next section). The fly floor is never higher than half the distance between the floor and the grid. The pin rail, to which the fly lines are attached, is a double row of 17″ to 21″ hickory, or iron, belaying pins—commonly just short pieces of 1″ pipe—stuck through about 8″ wooden beams or 5″ iron pipes running the length of the gallery and supported by heavy wood or channel iron posts. The two rows of pins, set on the on-stage side of the gallery, are arranged one above the other.

A well-equipped stage has 15 to 30 or more sets of lines, with corresponding pins, placed about 9″ apart and numbered from the proscenium back. The complete system of ropes, blocks, and belaying pins is commonly termed the *rigging.*

5. *Some General Methods of Flying Scenery*

A line is attached to a drop, or other hanging piece, by tying it around the upper batten or into specially attached hanger irons. The three ropes in a set are called respectively the "short," "center," and "long line" as they are fastened to the near end, middle, and far end of the unit of scenery from the point of view of the flyman. The knots (Fig. 41) used in making the ropes fast to the scenery must be those which combine absolute security with ease in untying. The bowline is commonly used for straight lifts, and the clove hitch for horizontal and bias pulls. If a quick attachment (*temporary* only) is to be made on a light piece of scenery, the slip knot may be employed. This knot, which will not hold well on a batten, is useful only for tying a line into a ring or onto another line.

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[1] For a proscenium over 30′–0″ wide, four or more loft blocks are required in each set. The maximum distance between these blocks is about 15′–0″.

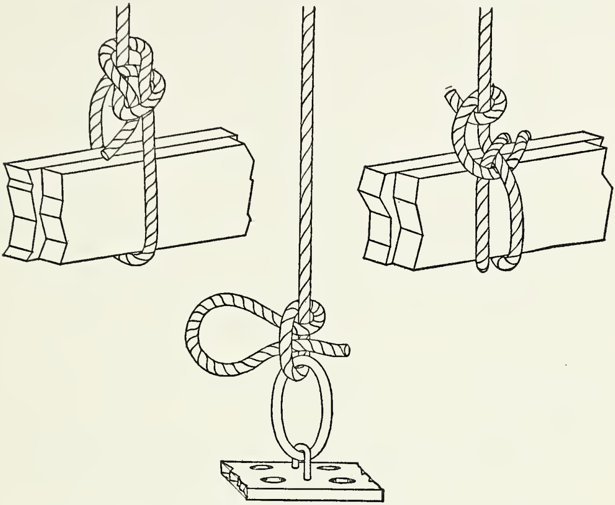

Fig. 41. Knots Commonly Used in Hanging Scenery

The bowline (left), the clove hitch (right), and the slip knot (center).

On units which have no free battens to which lines can conveniently be attached, hanger irons are used (Fig. 42). These are fastened vertically, ring end upwards, to the back of the unit, near the top, by means of ⅞″, or longer, No. 9 screws. If the weight on each iron exceeds 50 lbs., one or more 3⁄16″ stove bolts should be used with the screws.

The unit to which a set of lines has been attached is "flied" simply by pulling on the ropes. When it has reached the desired height, the ropes are made fast to a belaying pin. The method for "tying-off" is illustrated in Fig. 40. The ropes are first carried around the lower end of the pin (from left to right), then up, across and around the upper end (from left to right), down around the lower end and up again, about two and a half times.

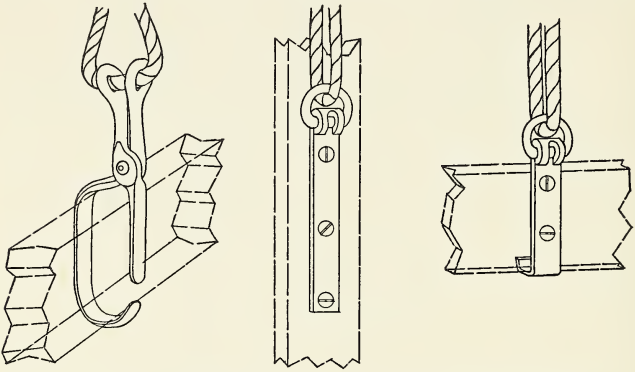

FIG. 42. A DROP HANGER AND TWO TYPES OF HANGER IRONS

The set of lines is finally made fast by making a loop, turning it over, bringing it down over the top end of the pin, and pulling it tight, as illustrated. The free ends of the ropes are coiled and hung over the same pin to prevent their being tangled with other ropes. For the sake of clearness in the drawing only one line in each set is shown.

There are two rows of belaying pins on the pin rail: the lower one for tying the drop, or other unit, when at *trim*—that is, when it is in position for the set—and the other pin for tying it when it is raised into the flies. This method of using the rail is found serviceable when a piece of scenery must be lifted and lowered during a performance. Trimming takes time which can ill be afforded during a quick shift. By using the two pins, the adjusting can be done beforehand. The lower tie remains permanent. When the appropriate scene arrives, the flyman loosens the ropes from the upper pin, lets them slide through his fingers, and when the slack is out he knows the drop or other hanging unit has come automatically to position.

Heavy pieces may be counterweighted by sandbags tied to the lines just below the head blocks (Fig. 43). A whole rear wall consisting of three or more flats battened together may be balanced this way. A convenient clamp sold by J. R. Clancy, Inc., is often used in place of rope for attaching the heavy sandbag to the lines.

A wide piece of scenery, such as a drop, may, in an emergency, be flied on two lines, instead of three, by using "bridles" as illustrated in Fig. 43.

On a stage equipped with a low grid a tall drop may be *tripped* out of sight by the use of a second, adjacent, set of lines attached behind to the bottom batten. When both sets of lines are drawn, the drop is folded back and up into a space only half its height (Fig. 43).

A small sandbag should be tied to every set of lines not fastened to scenery in order to prevent the ropes from being pulled through the blocks when drawn up out of the way, and to force the ropes to come down again with their own weight when released.

A word of caution. *One must be sure that all hardware and knots used in flying are secure.* Some serious accidents have resulted from pulleys or hanging irons or sandbags breaking loose during a performance. Ropes should be examined from time to time for signs of wear. Safety is the first law of the stage, as it is everywhere else.

6. *Some Specific Methods of Flying Scenery*

One flies a drop or a border by tying a set of three or more lines to its upper batten in the manner described in the preceding section.

A ceiling piece is suspended on two or three sets of lines, and lifted away or lowered to the standing set in the manner explained in Chapter III, Section 11.

To speed up the setting and the striking of a scene a complete back wall is frequently hung on a set of lines and flied like a drop. The several flats (single or hinged—see Chap. III, Sect. 7) which compose the wall are first laid flat on the stage, edge to edge, face

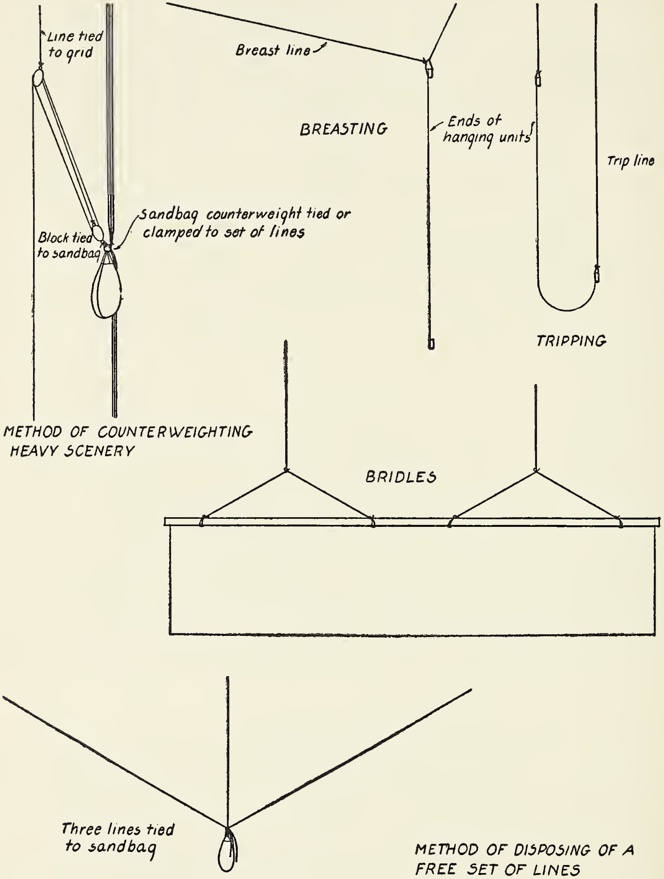
Line tied to grid
Breast line
BREASTING
Ends of hanging units
Trip line
Sandbag counterweight tied or clamped to set of lines
Block tied to sandbag
TRIPPING
METHOD OF COUNTERWEIGHTING HEAVY SCENERY
BRIDLES
Three lines tied to sandbag
METHOD OF DISPOSING OF A FREE SET OF LINES

Fig. 43. Some Common Methods of Manoeuvring Hanging Scenery with Lines and Counterweights

downwards, and fastened together to make a single rigid panel by placing two or more long battens, called "stiffeners," across the back. The stiffeners are fastened to the stiles of the flats by means of long screws or bolts, never nails. Ropes are tied into hanging irons attached at strong points (the center and two ends) to the back of the combination, and the wall is then raised and lowered as a unit. A side wall, also, may be flied in this way, by having tied to it single lines from an up-stage and a down-stage set. A whole box interior, with three walls, can, on occasion, be lifted from the stage as one piece by the use of one full set of lines to support the back, and another set of two to support the two front corners.

Heavy units should be counterweighted by large sandbags tied to each set of lines just below the head block, as described in the preceding section and illustrated in Fig. 43. If the wall of an interior which must be placed under the edge of a ceiling is to be balanced in this way, a small auxiliary block and tackle will have to be attached to the sandbag to lift the latter slightly, and so give some slack to the fly ropes when the wall is in position on the floor, in order not to foul the overlapping ceiling.

Canvas tree trunks and light columns may be suspended on single, independent lines which, in this employment, are termed *spotted lines*.

If the emergency demands it, furniture and other properties may also be flied. As a rule, however, it is not wise to play too many tricks with the fly system. An overloaded grid is not the safest of things under which to carry on a performance.

7. *The Counterweight System*

In many of the newer theatres the fly gallery has been omitted and all flying is handled with a *counterweight system* [2] operated from the stage floor (Fig. 44). In each unit of the system a pipe batten parallel to the proscenium wall and to the floor is attached to small steel cables, which pass over loft blocks in the grid—in the same arrangement as the manila rope flying system (Sect. 4)—over a common headblock at the side, and down to a metal

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[2] The "counterweight system" must not be confused with the use of counterweighting sandbags in the older method of flying scenery (see the two preceding sections and Fig. 43).

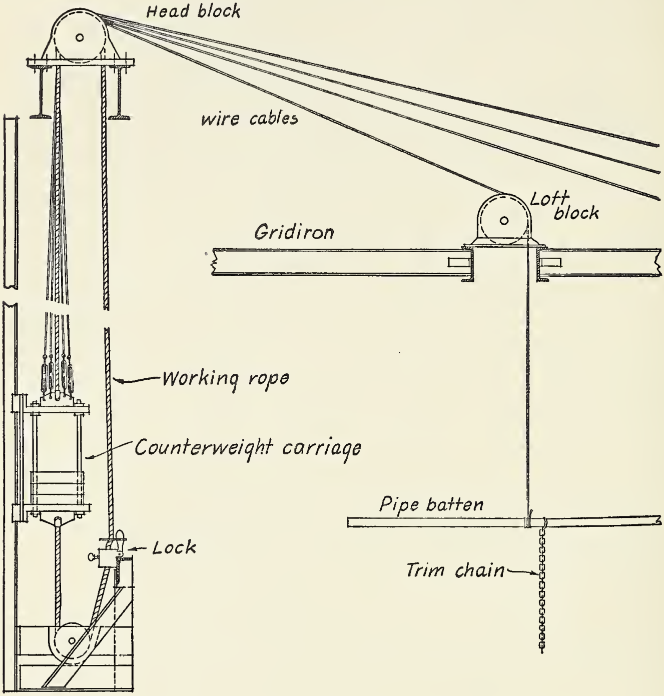

Head block
wire cables
Loft block
Gridiron
Working rope
Counterweight carriage
Pipe batten
Lock
Trim chain

FIG. 44. THE COUNTERWEIGHT SYSTEM. A UNIT

By this system hanging scenery is handled from the floor of the stage instead of from the fly floor.

carriage with adjustable weights, which slides up and down the wall in a vertical track. The three or more sheaves (pulley wheels) for the cables, and the one for a manila rope, which compose the headblock, revolve side by side on a common shaft. The manila operating rope is fastened to the top of the sliding carriage, passed up and over its own sheave in the headblock in the grid, down and under a single movable tension block near the stage floor and up again to the bottom of the carriage. The latter, pulled up or down by this "endless rope," in turn lifts or lowers the pipe batten it counter-balances. Scenery is attached to the pipe by means of trim chains. When a piece is flied to the proper height, the operating rope is fastened with a patent clamp lock. The balance weights are usually placed on the carriage from a narrow loading platform under the grid.

The most up-to-date stages today are equipped with both a counterweight system and the older rope system. The combination permits a flexibility of control impossible with one system alone.

8. *Flying on Small Stages*

On small platform stages where there is no possibility of constructing a regular gridiron, a makeshift can usually be arranged in the form of a few stout pulleys fastened securely to beams in the ceiling. As a minimum, there should be two sets of pulleys to take care of the front and back edges of the ceiling, one to swing the pipe batten holding the front lighting units, and another to support the sky drop up stage. If the scenery is light, the lines may be tied off on a row of common lash hooks fastened to a board nailed to the wall on the side.

A little more costly, but a considerably stronger and more generally satisfactory, substitute for a grid on a small stage may be had by installing a system of light steel I-beams and underhang blocks (Fig. 45). Four beams (about 4″), cut long enough to reach the full depth of the stage, are placed against the ceiling and secured into the front and rear walls. One beam extends back from a point above the center of the proscenium opening; two others from points about half way between that and the side walls; and the fourth from a point near the right or left side wall of the stage. Standard steel under-hang blocks with 4″ sheaves are clamped and bolted to the lower flanges of the I-beams in the same general arrangement of parallel "sets" as that employed in the lay-out of a regular grid (Sect. 4). Single blocks are attached to the three beams in the center, and triple blocks to the beam at the side.

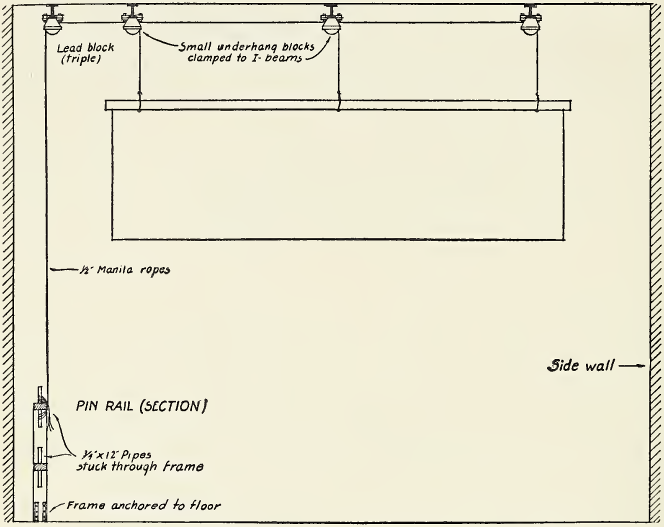

Lead block (triple)
Small underhang blocks clamped to I-beams
½" Manila ropes
Side wall
PIN RAIL (SECTION)
¾"x12" Pipes stuck through frame
Frame anchored to floor

FIG. 45. ONE METHOD OF RIGGING A SMALL STAGE WITH A LOW CEILING

A modified pin rail may be constructed by sticking 12″ lengths of ¾″ pipe through 2″ x 4″ wooden framing anchored securely to the floor. This framing should, of course, be placed directly under the beam carrying the triple blocks.

The lines should be ½″ manila ropes. Cotton rope can be trusted only for the lightest of loads.

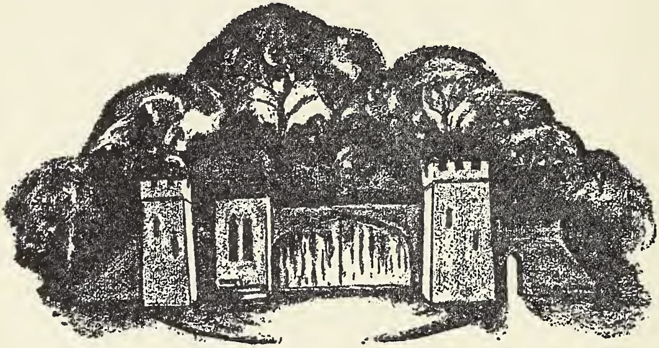
If the ceiling of the stage is low, a drop may be flied out of sight either by being "tripped," as described in Section 5, or by being dropped to the floor, rolled and tied, and lifted once more out of the way.

9. *Setting the Scene*

The exact plan adopted for the assembling of a group of scenic units varies, of course, with each scene. The following, however, is the general procedure for *setting* (putting together) a simple box interior (Chap. II, Sect. 2). After the ground cloth (Chap. II, Sect. 1) has been laid, the ceiling is hung and lifted high enough to clear the flats; then the latter are lashed together in position, starting with one down-stage end and continuing in order around to the other, stage braces (Sect. 2) being used where necessary. Door and window frames, if they have not already been bolted to their flats, are put into appropriate openings and clamped into place with their strap hinges. The ceiling is let down again, trimmed and tied off on the lower pin rail. Lastly, backings are placed behind doorways, and the sky drop or sky cyclorama is lowered. To *strike* (take apart) the scene, the ceiling is lifted two or three feet and a second tie in its lines made on the upper rail. The process of setting up is then reversed. An exterior scene is set and struck according to the same general plan.

When a group of scenic units is arranged on the stage for the first time, attention must be paid to proper placing and masking for good sight lines (Chap. VI, Sect. 6). The tormentors at the sides must be brought on far enough to hide the edges of the down-stage flats; and the teaser at the top must be lowered to a position where it conceals the flies, the front edge of the ceiling (if there is one) and the overhead lighting units (Part Three, Chap. III, Sect. 3 and Chap. II, Sect. 3). When the exact arrangement of a scene has been decided upon, it is a good plan to mark its position at the corners by means of a little dark paint (oil if permanent, water-color if temporary). This will insure accuracy in reassembling the scene.

All flats and other units should be numbered prominently on the back for quick reference, and be stacked in a definite order before the beginning of the performance. When they are set up and struck during the performance, they should be moved strictly according to this order. *Speed* and *efficiency* are two words which should never be out of mind wherever scenery is handled. Each shift should be plotted out carefully ahead of time, and rehearsed until the station of every man and the sequence of his movements become absolutely clear. As far as possible, all methods and procedures should be standardized. "A place for everything and everything in its place" is a motto that might well be tacked up prominently on every stage.



HAMLET

The permanent three-part setting used in The Carolina Playmakers' outdoor production in which Professor Frederick H. Koch, Director of the Playmakers, played the title rôle. Redrawn from Samuel Selden's design by Alice Lena Tuttle.

CHAPTER V

THE PAINTING OF SCENERY

1. *Introduction*

THE art of scene painting was at one time governed by many fixed rules of practice. This no longer is true. Certain tendencies in method, such as those outlined in the present chapter, may still be noted, but ultimate technique today is wholly a personal thing. Three common requirements only regulate the work of all modern scenic artists: (1) to mix and apply their paints carefully, in accordance with the nature of their media; (2) to execute their designs in a bold, free manner, avoiding fussy details, in order to create effects which may be viewed well from a distance; and (3) to paint in such a way as to coöperate to the fullest extent with stage lighting.

A. GENERAL PRACTICE

2. *Paint Materials*

The following materials are required for painting:

SCENE PAINTS. A distemper, or water color medium is employed almost exclusively on the stage, its advantages over oil being that it is applied more easily and quickly, it dries more rapidly, it does not shine, it is cleaner to handle, it is far cheaper, and it is not inflammable. That which is known as *Scene Paint* is the pure pigment in powdered form. Before it is used it must be mixed with glue and water. It is sold in sixty or more colors. Some of the most serviceable ones, which may be ordered from one of the firms listed at the end of the book if they cannot be bought locally, are given below with their approximate prices per pound.

Italian Blue	$.70
Ultramarine Blue	.30
Venetian Red	.12
Raw Sienna	.12
Burnt Umber	.12
Yellow Ochre	.15
Light Chrome Yellow	.30
Orange Mineral	.30
Medium Chrome Green	.25
Hanover Green	.60
Drop Black	.25

Other useful colors, some of which cost a little more, are Lemon Yellow, Burnt Sienna, Vermilion, Permanent Red, Purple Lake, Light Milori Yellow, Malachite Green, and Emerald Green. Certain brilliant hues are obtainable only in pulp. They are rather expensive and not generally needed.

The use of ready-made calcimine preparations is not to be recommended except when it is impossible to secure the pure pigments. They are usually too pale for the purpose of painting scenery, most of them come in a limited variety of colors, and they are mixed with a binding agent not very suitable for canvas surfaces.

WHITING. By far the most useful pigment for the artist is ordinary bolted whiting. He should estimate that he will use as much of this pigment as all the rest put together. Whiting may be bought at nearly every paint and hardware store, at a cost of from three to four cents a pound, and may be mixed like any of the other powders. Only good grade whiting free from sand should be used. Belgian whiting and Danish whiting are standards.

GLUE. Flake gelatin glue is much to be preferred to ground hide ("carpenter's") glue, though both may be used. These must be cooked. LePage's, which needs no preparation, may be employed in an emergency—but only in an emergency. It is too expensive for general use, and it has a tendency to dull pigments mixed with it. Nearly all other cold water glues are to be avoided entirely.

3. *Painting Implements*

For painting scenery four different brushes will be found serviceable: one 8-inch "priming brush," for covering large surfaces rapidly, one 4-inch "laying-in" brush, for smaller areas, one 2-inch "decorating brush," for detail work, and one ½-inch "liner," for ruling. There are a number of other types, such as round foliage, stencil and special laying-in brushes, which might be mentioned; but the four above will be found to be adequate for most purposes. They should all be of a good quality, long-bristle variety, flexible, and well set. Brushes deteriorate very rapidly unless care is taken of them. After every painting they should be rinsed, shaken out, and laid back to dry in a flat position. Never place a brush in boiling water.

Other necessary implements for the artist are:

A yardstick
Charcoal sticks
Chalk
A snap line (about 40 ft. of heavy braided cotton cord with a bent safety pin tied to one end)
A straight-edge bevel liner, for ruling short lines
A 12 ft. batten with a perfectly straight edge, for ruling longer lines
A number of 2–3 gal. pails and smaller pans
Metal paddles for stirring paint
A gas, electric, or kerosene stove with two or more burners

4. *The Preparation of Paint*

"Scene paint" is prepared when a pigment powder is mixed with a solution of glue called *size water*, made as follows. Three or four pounds of flake (or ground) glue are placed in a pail of water, allowed to soak for at least an hour (better overnight) and then cooked on a stove. The pail containing the glue is placed within another, with a little water and a block of wood or a brick in the bottom of the latter, double boiler fashion, to prevent burning. When completely dissolved, the glue is further diluted to make the size water. Four pounds of dry flakes will make from 4 to 6 3-gal. pails, or 6 to 9 2-gal. pails of size water. The more concentrated preparation may be kept as "stock" to be diluted as it is needed. Because time must be taken to remelt it whenever it is used, however, it is wise to make up several buckets of size water at a time to prevent delay in painting. If glue must be kept on hand for any length of time, a couple of teaspoonfuls of carbolic acid or Lysol may be put in it to keep it from decomposing. The strength of size water may be tested by dipping the fingers into it, removing them, and pressing them together for a few seconds. If on endeavoring to separate the fingers they adhere ever so slightly, the size is of the right mixture. If the fingers stick together quickly and rather firmly, additional thinning with warm water is required.

The glue solution should be warm when the pigment is added. Pour the powder into the solution slowly, stirring it thoroughly to prevent lumping, until the mixture has the consistency of heavy cream. It is difficult to give any more definite proportions for mixing scene paints as both glue and pigments vary. Veteran artists judge largely by the "feel" acquired through experience. If too much glue is used, the paint, when dry, will draw and crack on the surface of the canvas; also, the paint will have a tendency to look shiny, and dark stains may appear. If too little glue is used, the powdered surface will rub off on objects brushed across it. If too much pigment is used, the paint will seem stiff and heavy in brushing, and one stroke will have a tendency to pile up on top of the preceding one. If the mixture is too thin, it will look transparent on the canvas. The heavier pigments, such as Orange Mineral, and the metallic or bronze powders, require slightly stronger size than the other pigments.

The paint, when applied, should be at least slightly warm. The mixture in the bucket should be stirred from time to time to prevent the powder from precipitating to the bottom. If the pail is set aside for a while and grows cold, it should be thoroughly stirred with the paddle and placed on the stove for a moment before being used again, care being taken that the paint does not burn.

5. *Some Suggestions on the Blending of Paints*

It is seldom necessary to use colors pure, except for accents. For most purposes they should be mixed with at least an equal portion of whiting in painting the brighter blocks of color, and several times this amount in laying in the lighter tones. On the other hand, the use of whiting should be avoided when it is not needed. Whiting exerts a strong influence over other pigments in a mixture; even a small amount dropped by mistake into a pailful of some dark paint (such as Burnt Umber or Black) is apt to destroy its intensity and make it appear chalky.

The various pigments may be stirred together in any proportion. In very unusual circumstances is an artist fortunate enough to be able to find just the tone of a color he wants without blending two or more together.

A word of caution should be given to those experimenting with scene paints for the first time. Water colors invariably look darker when wet than dry, mixtures containing white being especially tricky deceivers in this respect. The final tone of wet paint may be determined by brushing a little of it on a block of wood and holding this near the stove for a moment to dry.

It is difficult to match blends. Before painting a sky drop or the walls of a set, therefore, it is wise to mix enough paint to insure its not running short at some critical point. Two 2 or 3 gal. pailfuls will take care of a drop 25′ x 30′, or a set of seven flats of standard width and 12′ high, very well.

6. *The "Prime Coat"*

The first coat of paint is called the "prime coat." Its purpose is to close the pores of the canvas and prepare a working surface for the following painting. Because whiting is the cheapest powder, it is commonly the chief ingredient used, but any other pigment may be employed equally well. Left-over scraps from the previous day's painting may be "boxed" together (poured back and forth into each other) and warmed up to prime the new flats. The only fixed directions for applying this first coat are to use a large brush, and to spread the paint evenly, smoothly, and not too thickly over the canvas, leaving no "holidays." (Holidays are parts of the surface which escape being covered.)

7. *The Following Coats*

One coat of paint should be allowed to dry thoroughly before the application of another, otherwise the damp pigments will mix and produce muddy spots. If the paints are properly mixed, one coat will completely hide the preceding one (unless it is extremely contrasting or it is mixed with an aniline dye). If it does not, it is probably too thin. If one coat picks up another, the fault lies in one of three possibilities: the fresh paint is too warm, that beneath it is still damp, or the under paint lacks glue. A little experience will quickly teach one how to avoid bringing about annoying conditions of this nature.

8. *Surface Textures*

Irregular surfaces on the stage are usually, when viewed from a distance, more interesting to look at than perfectly smooth ones.

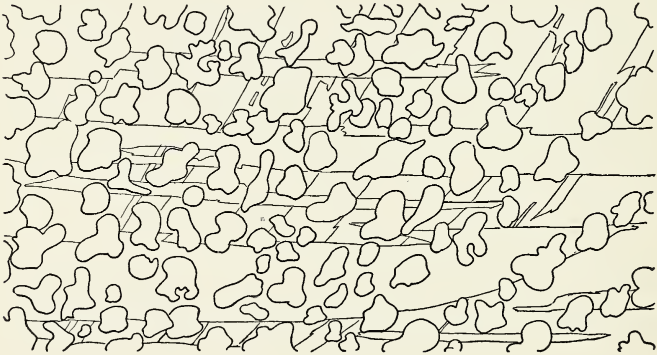


Fig. 46. Spattering

Full size of effective spattering for a "smooth" texture. For a "rough" texture the spots should be three or four times this size. Applied over scumbling.

For some reason, flatly painted scenery is never quite convincing; its chalky flatness reveals it to be what it really is, color-washed canvas. Even a slightly varied texture, scarcely recognizable as such from the audience, seems to "carry" where the other will not. The theory of "broken color," which maintains that "scintillation" is secured by breaking up a desired tone into its simpler elements and placing these side by side in little blocks for the eye at a distance to blend into one, finds one of its surest proofs on the stage. A plainly tinted wall painted by spattering, scumbling or rolling, one over the other, three coats, one red-gray, one blue-gray, and one yellow-gray, has a suggestion of life which one painted with the same colors mixed together in a pail and applied flat most clearly has not.

9. *Some Methods of Applying Paint*

The following are the most common methods of applying paint to scenery:

Flat Painting. The paint is brushed on smoothly and evenly. This is obviously the most simple method; useful for priming and laying on ground (base) colors.

Scumbling. A fairly dry brush is passed lightly, and with long free strokes, over the surface of the canvas in various directions in such a way as to conceal only partly the surface beneath. Unless an effect of obvious blotchiness or streakiness is desired, care must be taken to lay the strokes on fairly evenly. This method is useful for producing rough surface effects.

Dragging. The technique employed in dragging is similar to that involved in scumbling, except that a still drier brush is required. Dragging is useful for softening shadows and for lightly suggesting grain markings in wood surfaces.

Sponging. A large sponge, trimmed to present a flat surface, is dipped into a pail of paint, squeezed out, and patted gently over the canvas. Care must be exercised in using this method to cover evenly and avoid undue spottiness. The textural pattern should be continuous. It will be found helpful to pat in spirals or semicircles and to turn the sponge constantly in the hand. Sponging is useful also for producing rough or patterned surfaces.

Rolling. An effect somewhat similar to that obtained by sponging can be secured by dipping and wringing out a ragged piece of coarse linen or burlap and either patting it or rolling it freely over the surface to be covered. This is an excellent method to use for imitating old plaster or rock surfaces.

Spattering. A brush full of paint is shaken over the canvas or snapped by the wrist so that the paint falls in little drops. To insure evenness, it is well to start with one end or corner of a piece, or group of pieces, of scenery and to proceed systematically to the opposite one. One must be generous with the paint. A few tiny speckles will not be effective. At the same time, one must avoid dribbling from an over-wet brush and dropping large spots which recognized by the audience as paint may destroy the illusion of texture. If it is difficult for the artist to spatter evenly at the start, he will find it helpful to snap the brush by striking the wrist of the brush hand against the wrist of the other hand on each shake of the brush. One secret of good spattering lies in loading the brush each time with the same amount of color, that is, in dipping the bristles into the liquid the same distance (never more than about three-quarters of the way). Spattering is the method most used for producing broken color impressions. It is often combined with one or more of the other methods (see Fig. 46).

Glazing. Sometimes a thin, transparent wash of one color is brushed over another color, or group of colors, for the purpose of blending or softening, or heightening tonal values. A pail of wash for this employment may be prepared by diluting ordinary scene paint with size water, or by dissolving dye crystals in size water.

If a series of flats in a wall, or any other group of pieces which must be set together in a scene, is to be painted by one of the methods indicated here, it is imperative that the pieces be laid side by side in the proper order on the floor as a unit, to insure their being matched.

There are few really standard ways of painting scenery. The successful artist is an inventor and experimenter. The suggested solutions of the various problems that follow should be appreciated as hints chiefly for beginners. These hints will be modified or disregarded as one discovers better methods.

B. Specific Practice

10. *Interior and Exterior Walls*

The principles of broken color (Sect. 8) may be used in developing wall surfaces which are intended to appear either rough or smooth. For the smooth surface, which suits interiors better than it does exteriors, choose two or three colors which are nearly alike, such as blue-gray and yellow-gray; or light-cream, darker cream, and pink. Lay one of the colors on solid as a ground coat; when it is dry, spatter the second evenly over the first until it nearly conceals it; then spatter over these two the third in the same manner. If the spattering has been properly done, it should present a surface which, from a distance, at first sight will seem perfectly smooth, but upon closer examination will be seen to have just enough texture to prevent it from looking monotonous and uninteresting. If a hard texture is desired, the spattering should be done on a perfectly dry surface, if a soft texture, on a wet surface. Avoid working over a partly wet and a partly dry surface, however, for the result obtained by such practice will be very uneven.

The use of more widely separated colors in spattering will suggest stucco. If two or more colors are cleverly enough applied by the cloth-rolling method, a very convincing effect of old mottled wall paper may be produced. If a more pronounced design is desired, simple figures may be cut in oil paper and stenciled onto the wall. In applying the paint, use an almost dry brush to keep the paint from running. Avoid any very conspicuous patterns, or they will probably refuse to lie at rest on the surface. If the figures appear too vigorous when viewed from a distance, spatter them over lightly with a little of the ground color, to tone them back into the rest of the wall. Remember at all times that good scenery acts as an *environment* and does not obtrude itself into the play.

Sponging, another popular method employed in treating interiors, may be combined with either or both spattering and rolling. If carefully handled, quite dissimilar colors may be used together to produce interesting blends.

Old stained plaster, particularly effective for exterior walls, may be suggested by scumbling and blocking-in large irregular patches of various light and dark browns, or yellows, reds and blues, and spattering this all over, while still wet, with the same colors. Keep the darker ones at the top. As dark blue under the prevailing straw and amber lights of the stage looks nearly black, a little of this color may be mixed with a small amount of real black and sprinkled *very lightly* here and there over the plaster, to suggest holes and crevices. Guard against large drops or you will give away your secret.

Brick walls should be handled thoughtfully. Rows of regular red rectangles with hard white lines between, seen so often on amateur stages, never look very real. Even the most carefully laid walls in actual life show many irregularities and signs of weathering. One good plan to follow in painting is to scumble in first the plaster effect (later to be seen between the bricks) in a full ground coat—not in one tone, but in two, or three slightly different ones—and then to lay the bricks in lightly on top of this with a comparatively dry 2-in. or 3-in. brush. Vary red with a little neutralized orange, brown, and blue. It is well to keep the bricks in fairly straight lines, of course, but do not attempt to paint them too regularly. Knock off a corner here and there and touch occasional edges with darker blue to suggest stains. After the bricks have been laid in, spatter them all over very lightly with the same colors. Keep in mind that an *impression* is what one is trying to create, and that fussy details are lost on the audience.

The longer an artist works with scenery the larger, bolder, and freer his technique is apt to become. Painted walls, and all *environmental* objects on the stage, need not be wholly realistic. They must be pleasant to look at, and at the same time fulfill their dramatic purpose, the heightening of the visual mood of the play for which they were designed.

11. *The Shading and "Toning" of Walls*

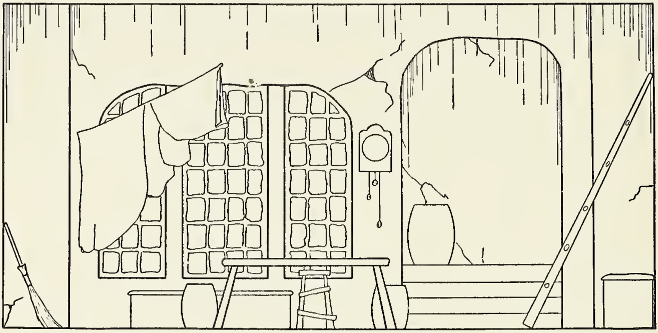
In creating wall surfaces an artist must work constantly for variety. He should give special attention to large plain areas. Unless they are well painted, they are apt to appear bare even under the best lighting. It is not enough simply to suggest texture (see Sects. 8–10). The artist should work for some difference between illuminated and shadowed areas. The light concentration on a high wall in a night scene, for instance, would naturally be near the bottom where the actors stand and walk in lamplight. In treating such a wall the artist might wisely lay his lightest tints low, and then shade them off gradually into deeper and deeper ones as he proceeds toward the top, until the wall appears to melt, of its own accord, into darkness. The outer edges of the wall, away from the light source, might likewise be made to step off into the shadows.

Wall surfaces may often be given increased interest by "toning" (tinting or graying) them with a light scumble or spatter of aniline dye dissolved in size water. One or more tints and shades may be used. A thin wash of silver—aluminum powder, wet with a little alcohol and mixed with size water—may be used in the same way. Dull-looking walls may be given a remarkable sparkle without appreciably changing their color, by treating them like this with silver. The dye and silver powders may be mixed in the same bucket, if so desired, and thrown together.

Both shading and toning, if they are to be at all effective, must be done very subtly.

12. *The Imitating of Woodwork*

Woodwork is very difficult to imitate satisfactorily with canvas and paint. As far as he can reasonably do it, a professional scenic artist likes to use real lumber on the stage. This he can do without great difficulty where it involves door frames and moldings; but it is obviously impossible to build a complete wooden interior to represent a shack or a log cabin. Where rough boards must be represented by painting, lay a ground coat of gray-brown, rule the flats with charcoal to indicate positions of the planks, and scumble in each with several shades and tints of brown, blue, and gray, using long strokes and avoiding making one plank exactly like the next. Alternate a couple of darker ones with one a little lighter, and vice versa. Vary the ends, or the middles, of boards. Stain the edges of occasional boards. Now, take a little Yellow Ochre, mixed with white, on an almost dry brush, spread the bristles of the latter, and with long sweeps suggest, very lightly, some more pronounced graining here and there. If the pattern of the graining must be made more obvious, mix up a little black aniline dye with size water and sweep it on in the same way with an almost dry brush. If the brown and yellow show up too brightly, reduce their intensity with a little gray or blue. Finally, outline the boards lightly and free-hand with blue accented here and there with black, and drag and spatter a little light gray-blue paint over the entire surface to help suggest the rough texture of the wood. An occasional knot-mark may be suggested (*suggested* only). A little real lumber seen in beams and supports will help to create the general illusion of woodwork. The convincing board effect in the walls of the mountain post office setting opposite page 251 was secured



An Elevation Sketch

Drawn by Samuel Selden for *Wappin' Wharf* by Charles S. Brooks by tacking pieces of 1½″ lattice to the faces of the flats to suggest weather strips, and then painting the "boards," as well as the real strips, in the manner described above.

In the more pretentious, or formal, types of interiors which must be dressed up with baseboards, dados, cornices, wall paneling and shaped door and window trims, strips of molding may be indicated (when the use of real wood is considered to be impracticable) by laying bands of suitable color and drawing on these, with a half-inch lining-brush, thin lines of high-light and shadow. Wherever the light may be presumed to strike an edge of the molding a line of high-light is ruled. In the hollows below this line (or above—depending on the direction of the light) the lines of shadow are placed. The color for the high-lighted strip is commonly prepared by mixing the "local tone" (body color of the molding) with a little white; the color for the shadows, by mixing the local tone with a little dark blue or blue-black. If the value of the ground on which the lines of high-light and shadow are to be drawn is quite light, pure white and pure pale blue may be substituted for the mixed colors. The pigment should be applied, with a fairly juicy brush, in long, clean strokes, the brush being carried the length of the straight-edge once only in each position. If the pigment is scrubbed on, the lines of light and shadow will look fuzzy, heavy, and unconvincing. To rule a crisp, thin line, the broader side of the little brush should be placed against the straight-edge; to mark a softer line, the flat side should be turned to the canvas.

13. *The Sky*

A large drop, high enough and wide enough completely to back up all exterior views, and painted blue, is commonly used to represent the sky (Chap. III, Sect. 12). As it depends chiefly upon lighting for its effect, its own tinting should be very soft. Mix not more than 3 or 4 oz. of Italian Blue, or Ultramarine Blue, in a pailful of white, and apply the paint with a large, absolutely clean brush, taking great care not to streak it. If it is a big drop, prepare two or three buckets of paint and "box" them thoroughly (that is, pour them back and forth into each other) before starting. To run short and attempt to match tints in the center of the sky is disastrous. The sky may be given a little texture and a surface which will better reflect the different qualities of light that may be thrown on it if it is spattered very carefully and evenly with pale, closely related tints of pink, purple, and blue (a fraction of a value darker or lighter than the main blue). It may be given added "scintillation" by mixing into the paint a little silver (aluminum) powder.

The old-fashioned practice of painting a landscape on the sky drop is now frowned upon by the best artists. Besides being difficult to do, it never produces very convincing results, and it limits the use of the drop. A simple sky may be used in every set of a play, while a painted landscape fits the locality of only one scene.

14. *The Landscape Pieces*

The character of an outdoor setting is better suggested by a few plastic "set" and "built" pieces, such as ground rows, silhouette hills, bushes, rocks, trees, and fences placed in front of the sky, than by anything placed on the drop. The construction of these is described in Chapter III, Sections 18 and 19. In painting them it is well to keep in mind that, except possibly for the sky on a cloudless day, there are no large masses of flat color in nature. Even a simple tree trunk will show a surprising number of hues and brilliances—perhaps a dozen or more browns, grays, blues and greens. Of course it would be impracticable to indicate very many of these, but at least two or three tones should be used to indicate that a piece of scenery represents a tree trunk, not a painted post.

Rocks are never a dead gray. For painting the lighted side of a block of granite use warmer colors, perhaps a dull cream varied with a little rose pink, light brown, and pale blue; while in the shadows use cooler colors, blue, bluish-green, and purple. Greenish patches of moss may be added. A sandstone wall would be painted in the same way with the addition of a little yellow. Work freely in large blocks of color. Sprinkle the whole piece lightly, when done, with a small amount of dark and light blue to break up the smooth surfaces and add texture.

Paint mountain rows in light greens, blues, and purples, and spatter them well with pale violet (Ultramarine Blue, White, and a little Venetian Red) to soften their outlines into the sky. Distant banks of earth may be suggested in much the same way by using Burnt Umber, Ultramarine and Italian Blue. Wherever possible, run a little of the sky color into the far-away objects.

In planning landscapes, keep colors as light as possible; vary the values of tints; and avoid black shadows. Paint objects in the foreground in purer, brighter colors than those in the background.

15. *Foliage*

To repeat the remark made in Chapter III, Section 17, thoroughly convincing foliage is very difficult to paint. The tendency now is to avoid the use of definite shrubbery and other leafy pieces as much as possible. In out-of-door scenes calling for the presence of trees, an artist generally tries to design his setting in such a way as to draw the main attention to three or four nude, but convincing, solid-looking trunks rising out of sight behind the teaser in the more brightly lighted foreground, while merely suggesting masses of leaves, intertwined branches, and silhouettes of other trees (done by means of dark cut-out drops viewed in silhouette) in the shadows of the background. If a foliage piece, such as a masking border, must be used in the foreground, paint it in blocks to hint at clumps of leaves, rather than individual ones; cut the edges and punch holes in the border (according to the characteristics of the foliage represented), and hang it in silhouette as much as possible. Dark Chrome Green, Leaf Green Lake, Malachite Green, and Hanover Green are good foliage colors. They may be modified by mixing white into them. A few touches of neutralized (softened, or grayed) red here and there will add roundness to the blocks of green. Patches of dark blue will add depth. Some artists prime their foliage pieces with pure Ultramarine and paint into it. The foliage forms, when they are completed, should not look heavy. They should be light, loose, and airy.

Certain colors give the impression of distance. Pale blues and violets are especially helpful in this respect. A little very light Ultramarine or Italian Blue spattered over a row of hills will make them appear to sit ten miles closer to the horizon.

C. The Theory of Pigment Colors

16. *Elements of Color and Color Mixture*

The three "primary" (foundation) pigment colors—as they are fixed in most modern color theories [1]—are red, yellow and blue. The three "secondary" pigment colors are orange, green and purple (sometimes called violet).[2] When the former are combined, they produce the latter. That is, red mixed with yellow produces orange. Yellow mixed with blue produces green. Blue mixed with red produces purple. We find it easy to understand the nature of these colors if we arrange them in a circle or "wheel," as illustrated in Figure 47. Colors neighboring each other on the wheel are called "analogous colors." Thus red, red-orange, and orange are analogous colors. Colors directly opposite each other on the wheel are called "complementaries." Thus, orange is the complementary to blue, red the complementary to green, red-orange the complementary to blue-green, and so on. In the center (or approximate center) of the wheel is gray,[3] the absolutely neutral point. Colors are brightest near the outside edge of the wheel and dullest near the center.

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[1] There are so many so-called "color theories," each supported by excellent arguments, that it is impossible to pretend that the one outlined here is the only right theory. The artist will find it, however, quite representative and practicable.

[2] Red, yellow and blue are approximated on the scene painter's palette by Permanent Red, Light Chrome Yellow and Ultramarine Blue; and orange, green and purple by Orange Mineral, Light Chrome Green and Purple Lake.

[3] For convenience in stating a theory, the position of gray may be said to be in the direct center of the color wheel. In a practical discussion of the actual mixing of pigments, however, it must be assumed that the true position of gray is a little off center, toward the "cool" side of the wheel. This means that it takes somewhat more than an equal amount of blue, green or purple to neutralize (see following paragraph) orange, red or yellow. The correct proportion for mixing an "absolute gray" out of the three primaries is yellow 3 parts, red 5 parts, blue 8 parts—depending to a considerable extent on the purity of the pigments and the reactions between chemical substances (Fig. 47).

When two colors, represented by two points anywhere on the circumference of the wheel, are mixed, they produce a third color. If this were represented in a diagram, the third color, or blend, would be placed somewhere on a straight line drawn between the two original colors. The position of the blend on this line would depend on whether there was more of one of the original colors than the other in its composition. It will be seen that a point on this line (anywhere short of the extremities) is nearer to the hub of the wheel (grayness) than one on the circumference. This explains the fact that a mixture is never as intense in tone as a pure pigment. When two colors are combined they tend to lose a certain part of their intensity. If pure yellow is combined with pure red, for instance, an orange is produced which, because it is a mixture, is not quite so intense as a pure orange of the same hue. The

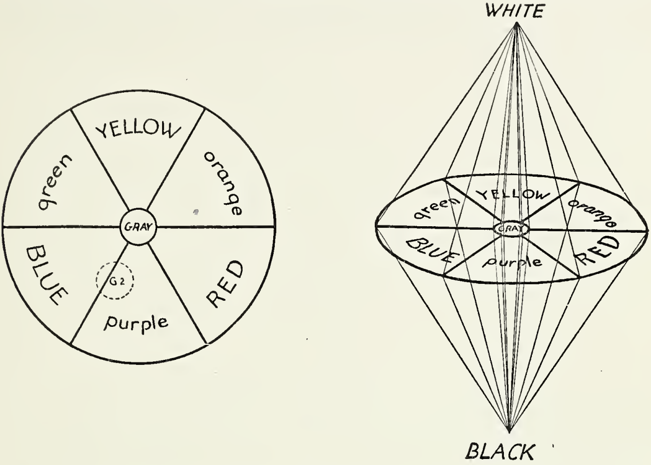

Fig. 47. The Color Wheel and Color Solid

G 2 in the color wheel indicates the true position of gray in relationship to the other hues (for color mixing). Blue and purple are less aggressive than yellow and orange. Consequently, to mix pure-gray tones one must use more of the cool than of the warm hues.

more widely separated on the color wheel are the colors to be combined, the grayer or more nearly "neutral" will be the blend. When complementaries (directly opposite colors) are mixed together in correct amounts they produce a pure gray. This is a useful principle to remember when preparing paint for scenery. A pigment which appears too bright may very easily be toned down, or softened, "neutralized," by the addition of a little of its complementary.

We have just glanced at the color wheel. This, however, is not a complete diagram of the behavior of color. If we place the wheel on edge, we find that it is merely a cross section of a three dimensional figure made of two cones with their bases placed together (Fig. 47). The points of the "solid" represent white and black and mark the extremities of the gray line passing down through the center of the figure. What happens to a color when it is mixed with white or black can now be seen very clearly. Not only is it lightened or darkened, as the case may be, but it is grayed as well. A cross section of the color solid may be taken at any point, between the extremities, to produce a perfectly proportional color wheel. The only dissimilarity between one taken near an end and one taken near the center would lie in the fact that the colors on the circumference of the former (as they would all be mixed with more gray) would be less widely differentiated than those in the latter.

A color, then, has three characteristics, which are determined by its position in this figure. Its *hue* is determined by its position in relation to other colors on the circumference of the wheel—that is, by its redness, yellowness, or orangeness, or blue-greenness, and so on. Its *saturation* [4] is determined by its nearness to the center—that is, the amount of gray, or of its complementary, it has in its composition. The *brilliance* is determined by its lightness or darkness—in other words, the amount of white or black it has mixed with it. A color of high brilliance is called a *tint*, of low brilliance, a *shade*.

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[4] See the term, *Saturation*, applied to light (Part Three, Chap. IV, Sect. 3).

If we were to list some of the more obvious characteristics of color we would include the following:

Red, orange and yellow are "warm."
Green, blue, and violet are "cool."
Analogous colors are harmonious.
Complementaries offer the greatest contrast.
Colors of high brilliance are more "exciting" than those of lower brilliance.
Lower brilliances give a greater impression of dignity than the higher ones.
A little bright color outweighs much gray.
Mixing colors always lowers saturation. The more widely are separated the hues, the grayer will be the result.

The behavior of spectral (light) hues differs considerably from that of pigment (paint) hues. The color theory for lights is discussed fully in Part Three, Chapter IV.

17. *Color Harmony*

It is difficult to lay down any definite rules for the harmonizing of color in stage painting. Too much depends upon the texture of the materials involved, the composition of scenic elements, the lighting scheme and the distance from the spectator at which effects are to be produced for an artist to be able to make many generalizations in advance. The ultimate sense of fitness rests with the painter. A few tendencies in color combinations may, however, be noted.

Harmony is, to a large extent, the result of good proportion.

Almost any color may be placed next to any other color, provided it is used in a relatively correct amount. Two colors, which clash when combined equally, will usually appear well together in unequal quantities. Proportion involves balance. A little intense color, for instance, as we have already noted in the preceding section, will weigh against a considerable amount of neutral color. The following "rules" for combining colors are founded on principles that operate under most conditions on the stage:

1. Various shades and tints of the same hue may be used together in any proportion.
2. Analogous hues (that is, those lying near each other in the color wheel) may be used together in any proportion, if they are used alone.
3. Complementaries may be used together in unequal proportion.
4. Strict neutrals, very light tints, or very dark shades may be used together in their own classes in almost any proportion.
5. Intense (saturated) colors may be used with neutral ones in almost any proportion; though balance, especially in the consideration of large designs, generally demands that the neutral colors predominate.
6. A neutral background may be used to tie together smaller masses of bright colors that would otherwise clash.

The greatest encouragement that can be given harmony is to keep the larger areas of the scene fairly neutral, and to sharpen the sense of interest by building up intensities in certain smaller points only.

18. *Costumes and Scenery*

Working out an effective color scheme in a stage setting involves the careful consideration of two elements besides scenery—lighting and costumes. Because the first of these elements is discussed at length elsewhere (see Part Three, Chap. IV, Sect. 15) it will not be treated here. We are, however, offering a few suggestions concerning the planning of scenic values with costumes.

The main interest on the stage, as was stated in Chapter I, must always (except in those rare instances when an environmental form takes, for a shorter or longer period, a leading part in the story) focus upon the player. Correct color in design helps to do this. Because the most intimate coloring connected with an actor is that which he carries on his person—in his clothes—every possible effort must be exerted to prevent the destruction of costume values in the stage picture. This means, in the first place, that a proper contrast has to be maintained between the color of the walls, or woodwork, or foliage forms and the color of the suits and dresses worn by the actors. Unless there is to be seen at least some appreciable difference between the intensity, the brilliance or the hue of the background shapes and the living figures moving in front of them, the living figures will sink into the background shapes and assume their character. A great deal in the way of separation can, of course, be achieved by a system of lighting which picks out the actor and leaves the scenery in partial shadow (lightness and darkness mean a variation of brilliance); but the responsibility for creating effective contrasts should not rest wholly with the lighting artist.

With contrast there must be harmony. Background and foreground forms should complement each other and demonstrate at every moment their schematic relationship. The most effective results are generally secured by keeping the larger scenic areas fairly neutral in color (this does not mean dull) and by locating the brighter accents in the smaller objects, but especially in the costumes. This can be worked out more easily, of course, for the "dressy" type of play than for the plainer, workaday kind. However, even in the most severely realistic, unornamented folk play something can be done in regard to the choice of clothes—a blue or a red shirt, perhaps, a green hat, a boldly flowered blouse, or just a clean white apron—to lend a little color emphasis to the actors.

When costumes are being considered, thought must be given not only to walls and woodwork, but also to large hangings, table cloths and upholstery. The effect of many a handsome evening gown on the stage has been ruined by the unlucky presence of a clashing curtain or couch cover.

Costumes and scenery, under ideal conditions, are designed by the same artist. When there are two persons, the artists work together in close intimacy, comparing carefully their initial sketches, and checking and rechecking each other's plans until the setting has achieved its completed form on the stage. The two artists indicated must, in turn, consult the lighting artist; and all three artists must maintain an unbroken contact with the director of the play.

CHAPTER VI

THE DESIGNING OF SCENERY

1. *Introduction*

If the constructing, the painting, and the assembling of a group of scenic units to form the visual environment of a play are to be performed effectively and efficiently, they must be carefully planned in advance. The laying-out process may be done in a variety of ways: by making a pencil, ink, or color sketch, by drawing a floor-plan, or by building a small model of the proposed set. The process of evolving a scenic idea in the professional studio more often than not includes all three of these steps. The stage picture as seen in elevation through the proscenium arch by the audience is first visualized in a general way in an ink or color sketch; then the arrangement of walls, entrances, steps and other parts is worked out carefully in a floor-plan; and finally the complete setting is checked from a three-dimensional viewpoint by constructing it in miniature form as a scale model of wood or cardboard. The technique of developing scenery through these three steps, and the method of converting the completed plan into working drawings for the carpenter is outlined briefly in the following pages.

A. Media of Design

2. *The Sketch*

Having decided what shall be the dramatic idea of the contemplated setting, and what the interpretation of this idea through tactile design, the artist usually attempts to visualize the setting first in the form of a sketch. Drawn in pencil or ink, and usually developed in water color, the "sketch" represents an ideal view of the projected scene as the latter would be seen from the front, through the proscenium, by a member of the audience. Offering, as it does, the best opportunity for the working out of the artist's ideas in line, mass, and color, it is on this step in the evolution of the setting that many designers expend their best effort.

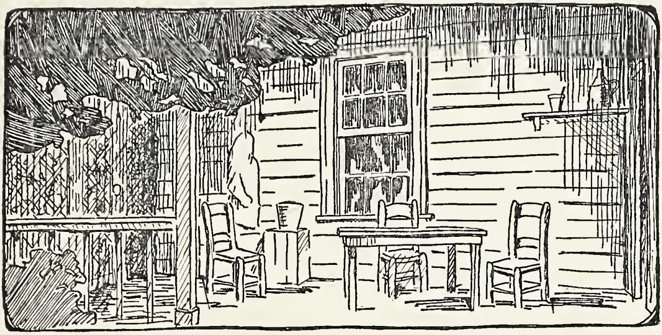

FIG. 48. A PRELIMINARY PEN AND INK SKETCH

By Samuel Selden for a setting for *On Dixon's Porch*, by Wilbur Stout and Ellen Lay, as produced by The Carolina Playmakers.

One or two suggestions on the mechanical arrangement of the sketch are offered to those who are in doubt as to just what the drawing should include. Let the outside border of the sketch represent the proscenium opening. Draw the set within this boundary as one would assume it would be seen by a person sitting in about the center of the auditorium, downstairs. Suppose the set is to represent a simple box interior. From this position one would see the whole back wall, a little of each side wall (in sharp perspective), a very narrow strip of floor and nothing of the ceiling.[1] As the teaser is always trimmed two or more feet below the edge of the ceiling, to accommodate the borderlight and spotlights (Part Three, Chap. III, Sect. 3), the ceiling (unless it be made to slope down at the back) is never seen except by those sitting in the first few rows of the orchestra. This would obviously be a poor spot from which to design a scene. Figure 48 represents a rough pen and ink sketch for an exterior scene. Mr. Robert Edmond Jones' water color sketch for *Faust* opposite page 148 represents a more finished technique in this field.

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[1] If the relationship of parts in a design is quite clear without their being shown in perspective, the sketch may be drawn in simple elevation (Fig. 50), in which case the floor can be indicated by one straight line. (See Fig. 9.)

One cannot emphasize too strongly the importance of keeping proportions accurate. If the maximum dimensions of the practical proscenium opening of the stage on which the scenery is to be set up are only 20′ x 12′, for instance, one must not design a layout that would require an opening 50′ x 30′ to show the whole scene. Disappointment in the final staging of a scene, besides an endless amount of annoyance in the process of its creation, can be avoided only by strict honesty in the initial sketching. In other words, never indicate in the drawing anything that cannot be made thoroughly actual in production.

3. *The Floor-Plan*

After the artist has worked out his inspiration first in the form of a general sketch, he develops his ideas further by making a diagram of them. The most valuable diagram he can use is the floor-plan. The floor-plan is a skeleton outline which shows the relationship of the walls, doors, windows, platforms, stairways, and other features that enter into the scheme of the scene, as these features would be observed from above, looking down onto the set. The diagraming can be done quite simply in a few lines. Floor-plans of different scenes are shown in Figures 8–11.

If a floor-plan is to be of practical value, it must be drawn carefully to scale throughout, and it must include the positions and dimensions not only of the main elements of the scene, but also of the incidental units, such as backings for the doors, set pieces seen through the windows, and the larger properties as well. The size and position of the proscenium opening and the placement of the tormentors in relation to the set should likewise be indicated. In this outline the arrangements for lighting the scene may also be blocked in.

An artist frequently plots his first rough ideas, as well as his later more matured ones, in the form of a floor-plan. A simple outline helps him to organize his ideas before he works them out in his sketch.

4. *The Model*

For those persons who possess a creative understanding of scenery, but who cannot draw in perspective, an excellent medium of design is offered in the "model." A model is a three-dimensional miniature of a stage setting built carefully to scale out of wood, cardboard, or other material (Fig. 49). Many artists who develop their ideas in sketch form make use of this miniature also, either to check up on their plans before they lay them out in the final working drawing for the carpenter, or to demonstrate their plans to other members of the producing staff. The model is especially valuable to the artist who is required to submit in advance the scheme of a proposed setting to a director for his approval. A model usually presents a setting much more clearly and definitely than a sketch of the same scene.

The model is constructed most easily out of light cardboard. Two-ply bristol board with a finished surface for painting is excellent for this purpose. Matt board with an egg-shell surface makes a better model, but is more difficult to work with. The model described below is of bristol board. The walls are first drawn out carefully to some definite scale such as ¼″ = 1′ – 0″ or ½″ = 1′ – 0″. (A scale of ½″ = 1′ – 0″ indicates that ½″ in the model represents 1′ – 0″ in the actual stage set.) When completely outlined, including door and window openings, the walls are cut out. This is done in one piece, if possible, because cardboard can be folded more easily than it can be fastened together. In cutting out the piece, or pieces, leave ¼″ or ½″ flaps along all those edges which must be joined with glue to other edges. Now, with the back of a knife or razor blade, score all lines along which folds are to be made. In each case score the cardboard on the side opposite to that of the crease. Fold the wall up and mount it on edge, by means of the ¼″ or ½″ flaps, on a piece of heavy cardboard or a wooden panel. If the glue does not hold at first, the joints

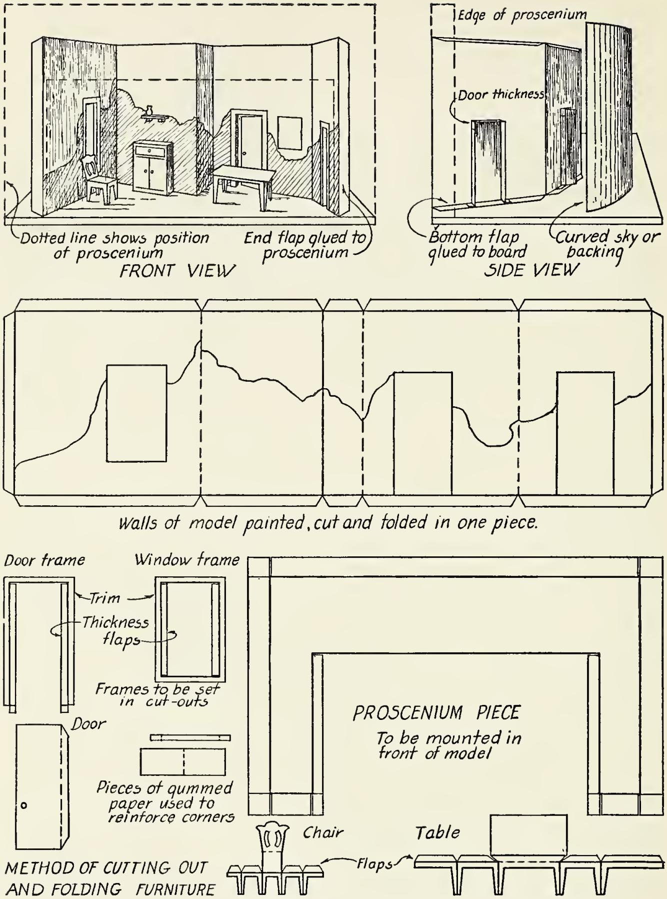

Dotted line shows position of proscenium
End flap glued to proscenium
FRONT VIEW
Edge of proscenium
Door thickness
Bottom flap glued to board
Curved sky or backing
SIDE VIEW
Walls of model painted, cut and folded in one piece.
Door frame
Window frame
Trim
Thickness flaps
Frames to be set in cut-outs
Door
Pieces of gummed paper used to reinforce corners
PROSCENIUM PIECE
To be mounted in front of model
Chair
Table
Flaps
METHOD OF CUTTING OUT AND FOLDING FURNITURE

Fig. 49. The Construction of a Cardboard Model

The various pieces are cut out and folded forward on the dotted lines and backward on the heavy black lines. Scale about 1″ = 6″.

may be temporarily held in place by means of thumb tacks or paper clips. Rubber glue is superior to the ordinary forms of glue for making models. Pieces of gummed paper strip, such as that used for binding packages in stores, are excellent for making or reinforcing joints.

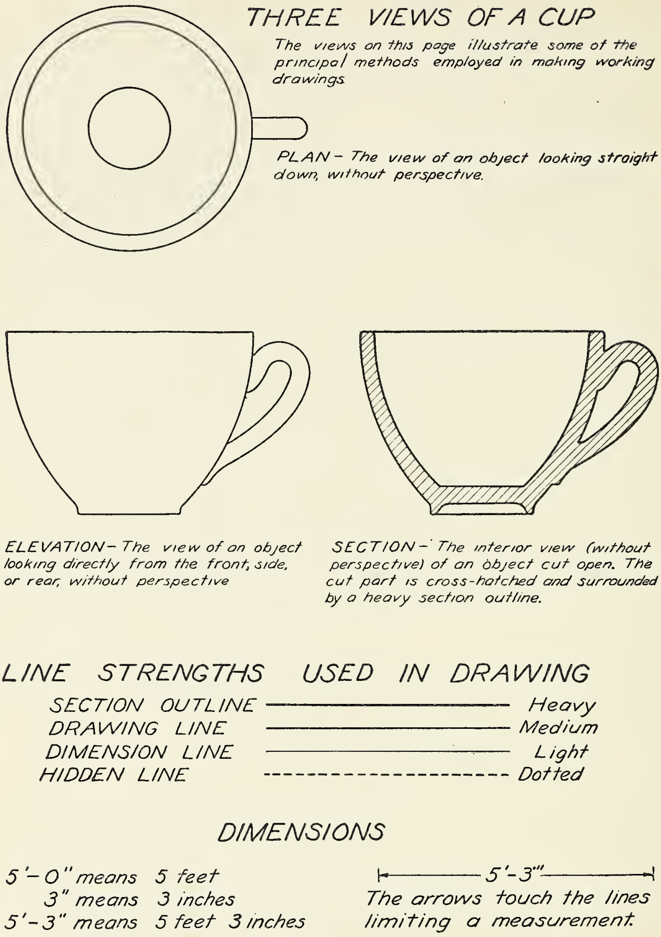
Usually the walls of the model are decorated before they are folded. Common water-color or show-card paints may be used for this purpose. Door and window openings can be made to look more real by the insertion into them of paper "thicknesses" (Chap. III, Sect. 8) designed to represent the door and window casings, and the fastening of small door shutters or window sashes to the back edges of the thicknesses. Bits of furniture, folded out of paper and painted, add considerably to the effectiveness of the little set.

When the interior of the miniature has been finished, cut out a small proscenium to the same scale, paint it black, and mount it in front of the set as a frame for it. Place a light-blue sky cyclorama at the back, bring the sides up and fasten them to the rear flaps of the proscenium. Add any foliage cut-outs or mountain rows called for in the final plan. If the walls of the model are made a little higher than the proscenium opening, no ceiling need be used. In fact, it is a good plan in any case to leave at least part of the top open for lighting.

If the model must be constructed for transportation or other rough handling, it may be enclosed (excepting the top) in a wooden or cardboard box.

5. *The Working Drawings*

The working drawings of a set of scenery are the building plans drafted for the carpenter. Laid out to some selected scale—such as ¼″ = 1′ – 0″ or 1″ = 1′ – 0″—they show the exact dimensions and construction of each unit, and include indications of materials to be used (if this is not apparent) and written explanations of all points that cannot be made clear by lines and figures alone. As the lines, however, are always more eloquent than the figures, words are employed very sparingly. If more than a couple of dozen phrases are needed on any one sheet, the plans may be considered



The views on this page illustrate some of the principal methods employed in making working drawings.

PLAN – The view of an object looking straight down, without perspective.

ELEVATION – The view of an object looking directly from the front, side, or rear, without perspective

SECTION – The interior view (without perspective) of an object cut open. The cut part is cross-hatched and surrounded by a heavy section outline.

SECTION OUTLINE — Heavy
DRAWING LINE — Medium
DIMENSION LINE — Light
HIDDEN LINE - - - - - Dotted

5'-0" means 5 feet
3" means 3 inches
5'-3" means 5 feet 3 inches

The arrows touch the lines limiting a measurement.

Fig. 50. Methods and Symbols Employed in Drafting Working Drawings

Illustrated in the drawing of a common coffee cup.

to be poorly done. Details, such as the plan of a difficult joint, an arrangement of molding, or a special placing of hardware, are shown separately in enlarged detail drawings. Three-dimensional units, such as stairs, and platforms are laid out both in plan and elevation. Cross sections of units are added wherever they are necessary for clarity. As building principles on the stage are seldom complicated, it is usually unnecessary to make drawings elaborate.

If the carpenter who is superintending the building of the scenery is a man of experience in the ways and means of the stage, it is, of course, a waste of effort to include in the working drawings all such details as the standard arrangement of parts in steps and parallels, of frame supports for columns and trees, or of joints and hardware on simple flats. Usually mere outlines of such units, with their widths and heights and the positions and sizes of any special features, like door or window openings, are all that are required.

The whole drawing, with the exception of details, should be done accurately to one scale. For this purpose the use of the scale-ruler, such as that employed by architectural and mechanical draftsmen, is quite essential. By accuracy we mean that a line on the paper 6″ long should not vary from 6″ by more than 1/32″. If an enlarged detail is shown, write the scale immediately under it. The scale for the completed drawing should be placed in the lower right-hand corner of the page. Check dimensions carefully several times and be sure that the sum of the dimensions of parts equals the over-all dimensions. If there is a discrepancy, the carpenter will probably toss up a nickel to decide which is correct. Small errors of less than an inch in the completed set may make it difficult, or even impossible, to put the set together.

B. OBJECTIVES IN DESIGN

6. *Making the Stage Setting Practicable*

The effective stage setting fulfills three general requirements: (1) it must be practicable, (2) it must be attractive, (3) it must be expressive.

In the first place, the setting should be planned so that it can be used efficiently and effectively by the actors. The artist must provide for, in the places where they are most needed, the entrances, exits, platforms, steps, chairs, tables, and other means for walking, standing, sitting, and lying demanded by the action. The artist must see that his scenery is also safe and strong. He should make certain, for instance, that a platform which must bear the weight of a number of people is properly reinforced, that a wall, or a door against which an actor is required to fall at some moment in the play is properly braced, and so on. All these points it is his privilege and duty to work out carefully with the director.

The designer must arrange his setting so that all its chief parts will be visible to every member of the audience—the man on the side, the man at the back, the man in the balcony, as well as the man in the ideal center. (See Fig. 12.) In order to obtain good sight lines for the stage action, he should see that his set is not too deep, and that the angles at the sides and at the top are right.

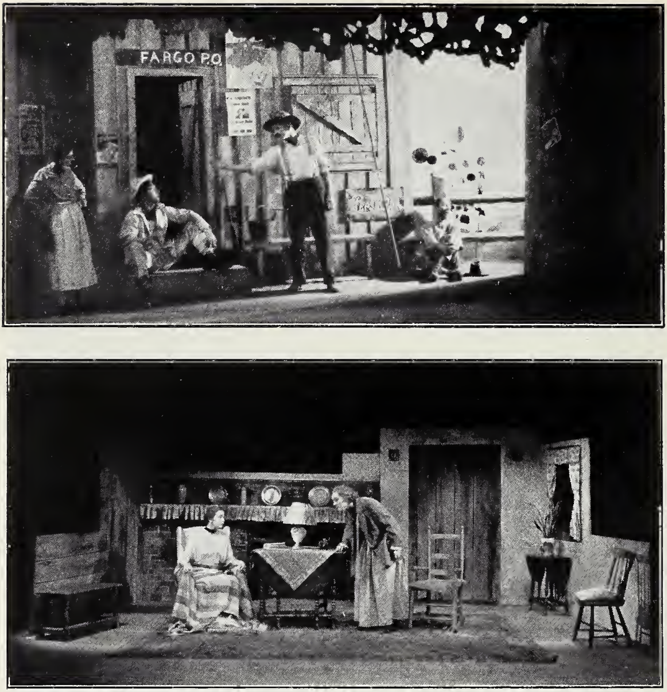
The artist must consider in his design not only the actor and the audience, but also the shop carpenter and the stage crew, and (far from incidentally) the business manager who guards the budget. In accordance, therefore, with the suggestions outlined in Chapter III, Section 1, the artist should plan scenery so that it may be capable of being:

(a) easily and rapidly constructed
(b) economically constructed
(c) quickly and silently shifted
(d) safely exposed to strain and wear
(e) well assembled
(f) readily packed or stored

The successful designer of stage settings is invariably a person who knows intimately the anatomy of scenery and who is familiar with the usual solutions to all of the fundamental problems related to the placement of that scenery in the theatre. Whether or not he always employs them, he is completely informed regarding the standard methods for building and handling scenery (Chaps. III and IV)—and improves on them when he can.

Wooten-Moulton

Two scenes from The Carolina Playmakers' première production of *Shroud My Body Down* by Paul Green, with music by Lamar Stringfield. The play was directed by Samuel Selden. Scenery by Samuel Selden assisted by Wilbur Dorsett.



Wooten-Moulton

Scenic environment for folk drama. Above, a full-scenery setting prepared by Mary Holland and Samuel Selden for *A Shotgun Splicin'* by Gertrude Wilson Coffin; and below, a suggestive, cut-down setting by Douglas Hume for Philip Parker's *Ancient Heritage*. Both plays produced by The Carolina Playmakers.

The artist of the stage is primarily a dramatist. But he can never hope to fulfill the high duties of his principal function until he has first made himself a wise and efficient technician.

7. *Making the Setting Attractive*

In the second place, as has been said, a stage setting should be *attractive*. By the use of pleasing shapes and colors in the surrounding forms it should set off the action, and make it appear at all times "good to look at." The artist must select for the design of his scene objects which have interesting and graceful qualities and arrange these in accordance with the principles of good composition.

A well-composed scene has, first, *unity*. All of its parts (the mass, line, and color forms of the larger units of scenery, and the properties, the costumes, and the lighting) are made to appear to belong together; they all contribute to the expression of one idea. This idea, of course, is that of environment particularly appropriate to the action for which the scenic forms are planned. The environmental idea to which all the parts of a design for the first act of Philip Barry's *Holiday* should be contributive, for instance, would be that of a "handsome room, and quite a comfortable room, but very, very rich." The idea in a design for the first act of *You and I* by the same author, on the other hand, would be a "motherly sort of room that pats your hand as you come into it, and tells you to sit down and be comfortable with the rest of us," and so on. Securing unity in a design involves then: (1) the selection of only those elements which may be related to each other and made contributive to the environmental idea (with the consequent elimination of all unrelated and non-contributive material); (2) the arrangement of the elements chosen into a plan that gives special emphasis to that feature, or group of features (the "motifs") which most clearly express the environmental idea; and (3) the maintenance of a single style throughout the design. A unified scene may be said to be one that is "well focused."

But a well-composed scene has also *contrast*. That is, it avoids monotonous repetition. Identical shapes and colors are not made to appear everywhere. Forms with vertical lines are varied with

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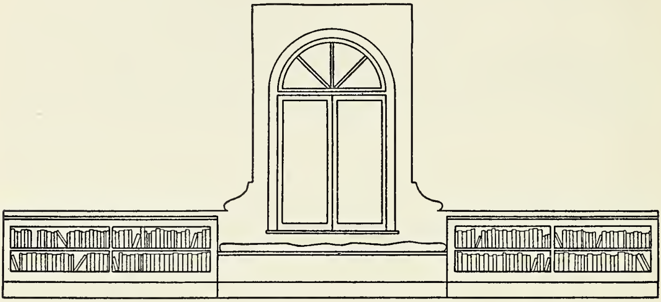
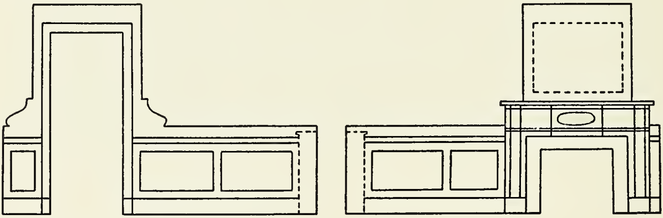
forms with horizontal lines, round objects are varied with square objects, intense colors are varied with neutral colors, light colors with dark colors (Chap. V, Sects. 16–17), and so on—contrast, a friendly rivalry, is introduced between the elements of the picture



REAR WALL



SIDE WALLS

Fig. 51. A Design for a Set of Cut-Down Scenery

Drawn by the author for *The Common Gift*, a one-act play by Elwyn de Graffenried, produced by The Carolina Playmakers.

to make the design alive and interesting. Contrast cannot, of course, be demanded at the expense of unity. If, however, the primary motif is allowed to dominate at all times, that is, the central idea of the scene is made constantly clear, there is little danger of unity being lost through variety in the contributive elements of the design. In fact, by their very difference from the main motif they may call attention to it and thus sharpen the sense of unity.

A well composed scene has also *rhythm*. Certain line and color forms are repeated here and there through the picture in such a way as to suggest pleasing visual "echoes." The curve of a window is reflected in the arched sweep of a doorway, a round mirror, a chair-back or an ornament on a table. The tint of orange, appearing in one of the details of a wall-paper pattern, is seen again in a pair of portières and, perhaps, the upholstery of a sofa, some cushions, or a lamp shade. A rhythmic arrangement of similar line or color motifs across a stage setting serves most effectively to establish unity.

Once more, a well-composed scene has *balance*. The prominent architectural features (such as the doors and windows), the larger pieces of furniture, and all the other objects of special pictorial or dramatic interest, are so distributed on the two sides of the stage that they "weigh" against each other more or less equally. Color, also, is put into equilibrium; likewise all the rest of the conflicting elements set in motion by the principles of contrast mentioned above.

Finally, the well-composed scene has *harmony*. In it all of the different elements coöperate in a friendly way to make an attractive whole. This is obviously the outcome of successfully giving the design unity, contrast, rhythm, and balance.

8. *Making the Setting Expressive*

In the third place, the stage setting must be *expressive*. The principal function of scenery, as has been observed in Chapter I, is to serve as an "environment." Through the power of suggestion in the visual forms which surround the action of the play, the setting must help to make clear the thought and the spirit of the play.

A setting rightly designed locates the dramatic action of a scene. It creates a specific home for it. The setting tells the audience whether the action takes place in a doctor's house in Norway, an artist's studio in Italy, a broker's office in New York, or a mountaineer's cabin in North Carolina. Through the use of suggestive shapes, colors and lighting the audience is informed concerning the conditions surrounding the action—the physical circumstances of the characters, the time of day, the kind of weather, and so on. But, more important still, the audience obtains intimate hints regarding the personalities themselves. The general appearance of a room, for instance, can be made to tell something about the tastes and habits of the people who live in it. The general state of tidiness in which the characters keep the room, the color they paint the walls, the kind of chairs they like to sit in, the kind of tools and utensils they use, the incidental, intimate objects they have lying about—all may be made to indicate personality, just as in real life. There are a hundred ways in which surroundings may be made to describe the thought and behavior of the characters in a play.

By the power of suggestion in surrounding forms, scenery may create *atmosphere* for the action. That is, it may cause the audience to view the action in a warm, sympathetic frame of mind. Consider, for instance, a setting for the famous little love scene in the avenue to Portia's house in the last act of *The Merchant of Venice,* suggested by Lorenzo's lines to Jessica:

> How sweet the moonlight sleeps upon this bank!
> Here we will sit and let the sounds of music
> Creep in our ears. Soft stillness and the night. . . .

A setting designed in the spirit of these lines would itself build up a romantic attitude toward the two lovers even before Lorenzo spoke. That is, it would create an "atmosphere." It would make the audience feel like saying to itself: "Moonlight in a garden is a place for love; in such unusually soft and expressive moonlight, in such a beautiful garden, these two young people must be very, very deeply in love."

Atmospheric scenery is what might be called emotional scenery. All the elements of which it is made up, individually and collectively, suggest human feeling. Through the eyes of the spectator they speak to him, in a symbolic language, without words or gestures, something about sadness, or loneliness, or weariness, or joy, or laughter, and put him into the spirit of the action of the play. In a setting for the scene in the convent park in the last act of

Cyrano de Bergerac, for instance, the soft fall of leaves, the quiet movement of black-gowned nuns, and the slow fading light through the trees, all help the audience to understand how a poetical old soldier's life is finally drawing to a close. All scenery that suggests in one way or another the thoughts and feelings of the characters that move within it has atmosphere. Gordon Craig's mist-covered rock for *Macbeth*, O'Neill's bleak farm-house in *Desire Under the Elms*, and the gay banquet hall and the quiet tomb of *Romeo and Juliet*, are all atmospheric. They "attune the audience to the proper mood for drama."

9. *Art and the Budget*

To conceive perfection in scenic design is one thing; to achieve it, another. Those of us who must labor in the theatre with one hand on the stage and the other stretched to the slim tin box in the business manager's office realize, often only too keenly, the truth of this statement. Under the emergency conditions occasioned by temporary or chronic budgetary depression, wise practice demands,

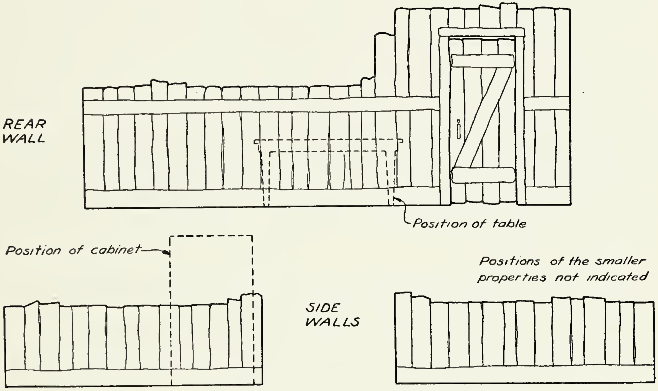


Fig. 52. A Design for Another Set of Cut-Down Scenery

Drawn by the author for *Fixins*, a one-act play by Erma and Paul Green, produced by The Carolina Playmakers.

of course, a compromise. It is a compromise, however, not of purpose but of method.

I have often been asked by the directors and technicians of small school and community producing groups what an ambitious artist is expected to do when he is allotted from the treasury for the preparation of scenery, not one or two hundred dollars, but a meager ten! My reply to this troublesome question is contained in one or two general suggestions. Hints only they are, because the ultimate solution of each emergency problem in scenic design is naturally influenced by specific circumstances, and must, therefore, be handled in terms of itself.

Any program of economy related to the stage usually involves some form of initial investment. The particular "money-saver" which is here recommended for purchase or construction by the artist required to provide a quantity of scenic environments on a frail allowance, is a black duvetyne, rep, or velour cyclorama. Hung around, and behind, the acting area on the stage, the cyclorama is employed as a neutral background for small screens and other low-cut scenic forms placed in front of it. It is surprizing what attractive, dramatically effective, and at the same time inexpensive settings can be produced with this combination of black curtains and painted set pieces. Examples of scenery of the suggestive type are pictured in the lower photograph opposite page 251, and in Figures 51 and 52.

The cyclorama should never, of course, be used by itself alone—except for occasional purely spatial settings. Black, unrelieved by color, is depressing and a view of it soon grows tiresome to the spectator. The "feeling" of a cyclorama setting is almost invariably imparted by the decorative and dramatic objects placed in front of the cyclorama. Black curtains on the stage should, therefore, be regarded purely as contrivances for masking from the audience the sides and top of the stage, and for providing a neutral, or spatial, background for the scenery proper.

If a sky drop (Chap. III, Sect. 12) is hung behind the cyclorama and is revealed for out-of-door settings by parting the two rear sections of the hanging drapery or, preferably, by raising these sections into the flies, greater contrast may be secured between "inside" and "outside" scenes. A suggested arrangement of cyclorama and sky-drop units for the ready accommodation of all kinds of abbreviated scenery is indicated in Figure 53.

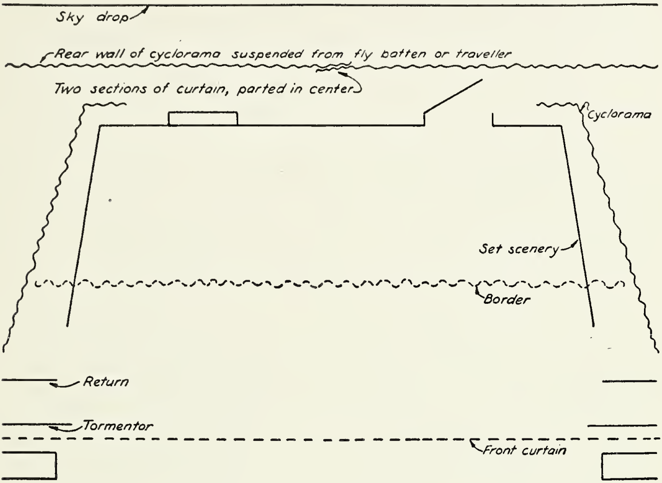

Sky drop
Rear wall of cyclorama suspended from fly batten or traveller
Two sections of curtain, parted in center
Cyclorama
Set scenery
Border
Return
Tormentor
Front curtain

FIG. 53. A STAGE LAY-OUT FOR MINIMUM SCENERY

Regarding the cost of the initial investment—a duvetyne cyclorama designed for a small stage, consisting of four sections (two for the back and one each for the sides), two borders, two tormentor-tabs, tie-lines, and a batten frame, may be made (see Chap. III, Sect. 13) for $50 to $100. Rep and velour curtains are heavier and stronger, but they are also priced a little higher. A muslin sky-drop might require the outlay of another $10 or $15. Whatever the expense of these two units is to the producer, he may rest comforted in the knowledge that he will soon save several times their cost in lowered scenery bills.

A GLOSSARY OF COMMON SCENIC TERMS

The identification of terms not listed here may be found by consulting the index.

Acting Area: That portion of the stage, enclosed by scenery, which is used by the actors during a performance.

Backing: A flat, a series of flats, a drop, a border, or a tab used to limit the view of the audience through an opening (e. g. a doorway or window) in a set of scenery. (See Fig. 8)

Batten: A length of rigid material, usually wood. The 1″ x 3″ lumber strips used to construct scenery are battens. The strips of wood fastened to the top and bottom of a drop are battens. The length of wood or iron pipe on a set of lines, to which scenery is often fastened for flying, is a batten.

Border: An abbreviated drop, used to represent overhead foliage or to mask the flies. (See Figs. 28 and 29)

Brace Cleat: A small metal plate attached to the frame of a flat. Into it a stage brace is hooked to prop up the flat. (See Figs. 13 and 38)

Ceiling: A large, horizontal, canvas-covered frame hung on two or three sets of lines, used to close-in the top of an interior set. (See Fig. 26)

Ceiling Plate: A metal plate with a ring, used in bolting together and flying ceiling frames. (See Fig. 26)

Corner Block: A small piece of 3/16″ 3-ply veneer board, cut in the shape of a triangle and used to reinforce joints in scenery. (See Fig. 15)

Counterweight System: A mechanical system for flying scenery with a counterweight running up and down a track at the side of the stage. In contrast with the pin rail system which is usually operated from the fly floor, the counterweight system is operated from the stage floor. (See Fig. 44)

Curtain Line: The line across the stage behind the proscenium which marks the position of the front curtain when it is closed.

Cyclorama: A large curtain of canvas, or other material—single or in sections—hung from a horizontal U-shaped wood or metal frame suspended by sets of lines from the gridiron. (See Fig. 30)

Door Frame Unit: A solid wood door frame made to fit into a flat. (See Fig. 21)

Down Stage: Any position on the stage near the footlights.

Draw Curtain: A type of curtain suspended from sliding or rolling carriers running in a track overhead. The curtain is opened by being drawn off to the sides. (See Fig. 4)

Drop: A large sheet of canvas, fastened to a batten at top and bottom and hung on a set of lines from the gridiron. It is commonly used to represent the sky. (See Fig. 28)

Fireplace Unit: A fireplace frame made to fit into a flat. (See Fig. 25)

FLAT: A unit section of flat scenery. A tall screen made of wood and canvas. (See Fig. 18)

FLIES: The space above the stage occupied by sets of lines and hanging scenery.

FLIPPER: A small piece of flat scenery hinged to a larger piece of flat scenery.

FLY, TO: To lift scenery up above the level of the stage floor (usually out of view of the audience) by means of lines run from the gridiron.

FLY FLOOR, OR FLY GALLERY: A narrow gallery extending along a side wall of the stage some distance above the stage floor. The ropes used in flying scenery are operated from this gallery.

FLYMAN: A man employed to fly scenery.

FOOT IRON: A piece of hardware used to secure scenery to the floor. (See Fig. 13)

GRIDIRON, OR GRID: The framework of steel or wooden beams above the stage which supports the rigging employed in flying scenery. (See Figs. 39 and 40)

GROUND CLOTH, OR FLOOR CLOTH: A large piece of waterproof duck canvas frequently used to cover the stage floor.

GROUND ROW: A low, flat profile of ground foliage, a bank of earth, a distant mountain range, or the like, designed to stand up independently on the stage. (See Fig. 36)

HANGER IRON: A piece of hardware attached to the frame of a hanging flat, or other unit, for flying purposes. It has a ring at one end into which the line from the gridiron is tied. (See Fig. 42)

HEAD BLOCK: See *Lead Block.*

JACK: A triangular device made of wood, which is hinged to the back of a ground row or other set piece for the purpose of propping up the scenery from behind. The end of the jack is fastened to the floor by means of a foot iron and a stage screw. (See Fig. 36)

KEYSTONE: A small piece of 3/16″ 3-ply veneer board, cut in the shape of a keystone and used to reinforce joints in scenery. (See Fig. 15)

LASH CLEAT: A small metal hook on the frame of a flat over which a lash line is thrown to bind the flat to the edge of another flat. (See Figs. 13 and 17)

LASH LINE EYE: The metal eye on the frame of a flat to which the lash line is attached. (See Figs. 13 and 17)

LEAD BLOCK, OR HEAD BLOCK: Three or more sheaves framed together and attached to the gridiron directly above the outer edge of the fly floor. The sheaves may be framed in a line, or parallel to each other on a single shaft. The ropes from the three or more loft blocks in a set come together at the lead block and pass on down together to the pin rail. (See Figs. 39 and 40)

Left Stage: Any position on the stage to one's left when facing the audience. (See Fig. 1)

Loft Block: A sheave (pulley wheel) in a steel frame bolted to the gridiron, used to run a fly rope. There is one block for each line in a set. (See Figs. 39 and 40)

Masking, or Masking Piece: A piece of scenery used to cut off from the view of the audience any part of the stage space which should not be seen. (See *Backing*)

Off Stage: Any position on the stage outside of the acting area.

On Stage: Any position on the stage within the acting area.

Parallel: The collapsible frame support for a stage platform. (See Fig. 32)

Picture Frame Hook and Socket: Small pieces of hardware used to hang a light-weight unit of scenery, or a property, on another unit. (See Fig. 13)

Pin Rail: The double rail holding belaying pins on which fly ropes (sets of lines) are tied. The pin rail is generally located along the outer edge of a fly floor. (See Fig. 40)

Pipe Batten: A length of pipe suspended on a set of lines. Flied scenery is frequently attached to a pipe batten by means of snatch lines instead of being tied directly to a set of lines. A pipe batten is a standard part in a unit of the counterweight system. (See Fig. 44)

Platform: A collapsible and portable frame platform constructed in unit sections. (See Fig. 32)

Practical: Practicable—capable of being used by the actor. A door with a swinging shutter, or a window with movable sashes, is "practical."

Profile Board: Three-ply veneer board of basswood, whitewood, fir, or other soft wood, usually 3⁄16″ thick.

Proscenium: The wall which divides the stage from the auditorium. The opening through which the spectator views the stage is termed the Proscenium Opening. (See Fig. 1)

Rail: A cross piece in the frame of a flat. In a flat 12′–0″ or less high there are a *top rail*, a *bottom rail*, and *one toggle rail* (which braces the center of the flat). In a flat over 12′–0″ there are two or more *toggle rails.* (See Fig. 18)

Ramp: An inclined platform, sloping up from the level of the floor.

Right Stage: Any position on the stage to one's right when facing the audience. (See Fig. 1)

Saddle Iron: A narrow strip of iron used to brace the bottom of a door flat, across the door opening. (See Fig. 20)

Set: A group, or series, of scenery units which suggest a single locale.

Set, To: To put up, or assemble, scenery for use. This word is generally combined with other words in a phrase—to *set the stage*, or to *set the scene.*

Set of Lines: A unit group of ropes hanging from the gridiron, used to fly (lift) scenery. There are commonly three or four lines in a set. (See Figs. 39 and 40)

SHEAVE: A grooved pulley wheel.

SHIFT: To change scenery and properties from one setting to another.

SIZE WATER: A thin solution of glue which is mixed with pigment powders to make paint for scenery.

SPOT LINE: A single line specially rigged from the gridiron to fly a piece of scenery which cannot be handled by the regular lines.

STAGE BRACE: An adjustable device made of two lengths of 1″ x 1″ wood held between clamps, used to prop up scenery from behind. A forked iron hook fastened to one end of the brace is hooked into a brace cleat attached to the unit requiring support, and an iron heel at the other end of the brace is secured to the floor by means of a stage screw. (See Fig. 38)

STAGE SCREW, OR PEG: A large, tapered screw with a handle, used to secure foot irons and stage braces to the floor. (See Figs. 13 and 38)

STILE: The long side piece in the frame of a flat. (See Fig. 18)

STRAP HINGE: A hinge with long tapered flaps, used principally for hanging door shutters in their frames and for locking door and window frames into flats. (See Fig. 22)

STRIKE, TO: To take apart and remove a set of scenery from the acting area after it has been used—generally at the end of an act.

TAB: A sheet of canvas or other material, framed or unframed, narrower than a drop but suspended like it—used chiefly for masking offstage spaces. (See Fig. 28)

TEMPLATE: A special type of work bench used in the construction of flats.

THICKNESS: A width of lumber, or other material, attached to the edge of an opening (a doorway, an archway, or a window) to give the edge the effect of depth, or thickness. (See Fig. 24)

THREE-FOLD: Three flats hinged together to fold inward, face to face. (See Fig. 19)

TOGGLE RAIL: The cross piece in the frame of a flat. (See Fig. 18)

TRAVELLER: A slotted steel or wooden track, used to hang draw curtains. (See Fig. 4)

TRIM: The wooden facing, about 4″ or 6″ wide, which surrounds a door or window opening. It is usually ornamented with moulding. (See Fig. 24)

TRIM, TO: To level off a flied piece of scenery at the right height for use during a performance.

TRIP, TO: To elevate the bottom of a drop, or other flied scenery, with an auxiliary set of lines in such a way as to make it occupy a space approximately half its height. Tripping is resorted to on stages where there is not sufficient fly space to get a unit out of sight by taking it straight up with one set of lines only. (See Fig. 43)

Two-fold: Two flats hinged together to fold inward, face to face. A two-fold is also called a *wing*. (See Fig. 19)

Up Stage: Any position on the stage away from the footlights.

Wagon: A low, rolling platform on which a section of a set may be mounted to expedite scene changes.

Window Frame Unit: A solid wooden window made to fit into a flat. (See Fig. 23)

Wing: Two or three flats hinged together to fold inward, face to face. On the old-fashioned stage a "wing" was a painted, and usually profiled, screen, which was pushed on stage in a groove to represent part of the side wall of a set. Hence arose the practice of calling the off-stage spaces to the right or left of the acting area the "wings." (See Figs. 19 and 1)

Wing Nut: A special type of nut which may be tightened with the fingers, without the aid of a wrench. (See Fig. 17)

PART THREE

CHAPTER I

AN ANALYSIS OF STAGE LIGHTING

1. *Introduction*

Light in the theatre is the means by which actors and their environment are revealed to an audience. That is, an important function of light is fulfilled when an audience can see comfortably the things the producer intends them to see. Other than this, light can be completely ignored, and some of the world's greatest dramatists did almost completely ignore it. Sophocles and Shakespeare made no use of light except for visibility, and their plays can be produced today (when necessary) with only sunlight. We can add, however, much to the emotional power of the actor and the play and to that which is aesthetically satisfying or agreeable about a production by using artificial light properly distributed and controlled. Many contemporary playwrights, too, completely ignore the newer functions of light, but there is some evidence to support the statement that modern playwrights are leaning more heavily, as time goes on, upon light for other purposes than mere visibility. Paul Green's *Tread the Green Grass* (see Figs. 1 and 2) is a case in point. In this play light, carefully coördinated with music, acts as an accompaniment, and light is almost as important an interpreter of Mr. Green's idea as the spoken lines.

Obviously, light for the purpose of revealing the actor and his background is as old as the drama and the theatre, but lighting was little more than mere illumination until late in the nineteenth century. True, Renaissance Italy knew that the intensity of light influenced tragedy and comedy, and succeeding generations in the theatre made some little use of light for mood, but Adolph Appia seems to have been the first to consider lighting as an art. In 1898 [1] he wrote of light as design, as a dynamic mobile means of emotional expression. Only recently, however, science and engineering have provided theatres with adequate apparatus to fulfill a part of Appia's dream. At last a few theatres have equipment for lighting control comparable with electrical and mechanical equipment in the field of ordinary manufactured goods. When this superior equipment for control is supplemented by lighting instruments that are designed and built with the care and precision of common binoculars and both find their way into theatres organized for something besides profit, Appia's conception of stage lighting will be an everyday reality. Indeed new functions of light will certainly evolve.

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[1] Adolphe Appia, *Die Musik und die Inscenierung*, Munich, 1899.

2. *Light of Two Kinds*

At present, however, light is of two general kinds. The first is form-revealing or shadow-producing light, which we shall call specific illumination. The other is shadowless light, which is commonly called general illumination. While the matter will be discussed in some detail later, our whole problem of stage lighting can be reduced to a least common denominator. This is little more than the proper manipulation and proportioning of these two kinds of light to form distributions according to the recognized functions of light for the production of plays.

3. *Three Controllable Properties*

Further than this, stage lighting can be analyzed into three controllable properties which we shall call *quantity*, *color*, and *distribution*. By changing these three properties, all functions of light, and accordingly all effects that artificial illumination seems to be capable of, can be accomplished. For example, on the stage, the amount of light can be varied between two useful limits: avoiding technical terms, it may be said that the upper limit is glare-producing light, which injures the eye, and the minimum limit or level is illumination so low that vision is difficult without strain. While one is trying to adapt his eyes to low levels of illumination, he is concentrating his attention on the visual stimulus and does not hear as well. Muscular control of the iris in the eye, called adaptation, controls the amount of light that falls on the retina. Because adaptation takes time, we must control our changes in illumination accordingly, especially from light to dark. For example, an audience can see a dimly lighted scene much more clearly (and with less strain) if the house lights are dimmed slowly and if the house is left dark for a few seconds before the curtain rises, than if the house lights are snapped off and the curtain opened immediately. The reason for this is that while the iris closes in a few seconds when light becomes brighter it takes as much as several minutes for the iris to open wide under some circumstances. Everyone has had the experience of stumbling about for a while upon entering a cinema theatre from bright daylight. A number of quick changes of scene with widely different levels of illumination will tire an audience much more rapidly than lighting slowly changed or kept at a single level of illumination, because the muscles of the iris have been overworked. It has been definitely proved by experiment that higher levels of illumination make people more alert, and we know by experience in the theatre that audiences enjoy a sophisticated comedy in bright light more than they do under conditions of poor visibility. The maximum quantity of illumination for any scene is determined by the wattage of the lamps, by accessories such as reflectors, and by the density of color media placed in front of the lamp. Changes in the amount of illumination during a scene, however, almost always should be accomplished electrically at the controlboard.

Color, too, was important in the theatre early in its history. In producing plays in the fifteenth century, not only were higher intensities used for comedy than for tragedy but different colors were used also. Warm colors were used for comedy and cool ones for tragedy. This conception of color has survived and is in common use today. Less general in its use, but still applicable to stage lighting as well as to costuming is the elaborate color symbolism that has developed through the ages. For example, white is said to be the symbol of light, chastity, truth, purity, peace, etc.; black, the symbol of gloom, death, night, mystery, and evil; red is said to suggest murder, fire, blood, health, passion, and shame. These are a mere beginning compared with the hundreds of symbols and ideas associated with one color.[2] Many are contradictory, and few if any have meaning when used abstractly or alone. For example, a setting flooded with red light might mean a dozen things from fire to passion, but if there were changes in intensity and familiar forms, or if the color were associated with smoke, most people would think of fire, although only a small part of firelight is actually red. In general, then, if one hopes to convey an idea to an audience by means of such symbols, or if he expects to affect an audience emotionally by means of changes in color, he should follow these simple suggestions. Color in costumes, scenery, and light must be directly related to the text of the play and with simple familiar forms. To be certain of no confusion in the minds of the audience one should also choose simple conventional symbols. Beside these, one must not forget the prejudices, color preferences, former associations in and out of the theatre, and the opportunity for confusion that an audience brings to the production of a play. Carelessly handled, color for this purpose can be nothing but a plaything of the artist that will confuse and dissatisfy an audience; thoughtfully and clearly presented, it can be an effective means of revealing the emotional and dramatic values in a play.

Color symbolism is probably more important historically than it is now in everyday lighting practice. A word of warning for the beginner, however, may be well taken. Of more importance for the present, however, is the intelligent use of color for variety, composition, and the natural appearance of the actor and his environment.[3] When setting up a scene, changes in color are made by changing the source to one of a different color or by changing the color medium in front of it.

Distribution means the way in which light of any quantity or color is spread or distributed over the acting area and the background. Obviously then, the three variables are closely interrelated. Distribution depends upon the use of both kinds of light, specific and general, to produce different levels of illumination on the acting area and on the scenery, and upon variety in color over the same surfaces. The fact that scenery, costumes, properties, and even the actors' faces and make-up vary considerably in their ability to reflect light and in the way they reflect it is a highly important consideration in the lighting distribution for a play. Even when an actor moves about the stage he changes the distribution of light because his body and costume are reflectors like any part of the setting. Thus the controllable properties take their place in an analysis of stage lighting. Stated in a single sentence, two kinds of illumination can be changed in quantity, color, and distribution, to accomplish the functions of stage lighting.

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[2] See Selden and Sellman, Part Two, Chap. VII, *Stage Scenery and Lighting*, 1930, and Luckiesch, *The Language of Color*, 1918.

[3] The effect of colored light on make-up, costumes, and scenery is discussed in Chap. IV.

4. *The Functions of Stage Lighting*

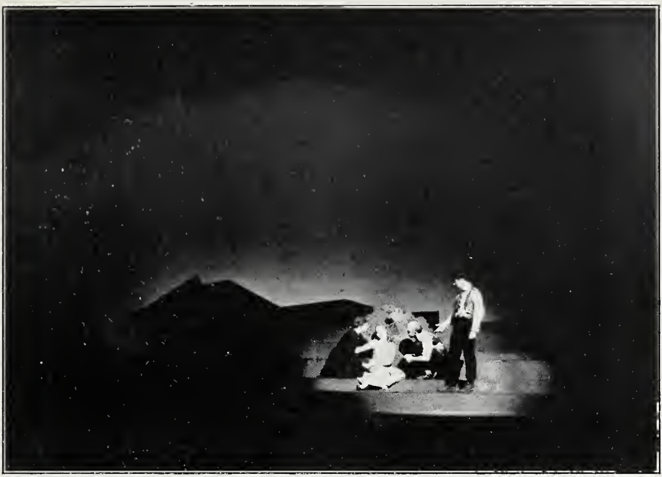
The real functions of stage lighting are pretty well established and agreed upon, but the names and number of them vary with opinion. For purposes of discussion and explanation these functions may be divided into five:

1. Selective Visibility
2. Revelation of Form
3. Illusion of Nature
4. Scenic Composition
5. Emotional and Psychological Effects

(1) *Selective Visibility* is placed first, because it is of primary importance that an audience see comfortably and clearly everything the producer intends it to see. Visibility depends upon the amount of illumination, the size of objects, the amount of light an object reflects, contrast with its background and the distance between the object and the observer. This is true anywhere, off the stage as well as on. Obviously, light at all times should be sufficiently bright for comfortable vision without strain, but schools and homes are still condemning small children to life sentences of spectacles. The theatre is only a minor offender in this respect, and more often gives the audience too much illumination rather than

too little. But everything must not be illuminated to the same degree. Visibility must be selective if the audience is to see only what is intended for it at any moment. For example, in *Green Grow the Lilacs*, a play by Lynn Riggs, three scenes are within the proscenium arch and exposed to the audience at the same time, but while the attention of the audience is concentrated on one scene, the light in the other two is very dim. This is a matter of having the proper relative amounts of light in the several scenes to produce a pleasing distribution of light without allowing the audience to be pulled away from the most important scene at any moment. By lowering the level of illumination, visibility can be reduced until an object completely disappears or is left inconspicuously in shade or shadow until one wishes to have the object come forward. This method of lighting is always effective with a permanent set when changes are made by moving from one part of the stage to another. Color, too, is concerned with visibility. In yellow light visibility reaches the maximum and drops off in blue and green and in orange and red. Because of this fact higher levels of blue light are necessary for a night scene than if yellow light is used. On the other hand, monotonous uniform distributions of blue light in large quantities quickly bring fatigue to the eyes of the audience.

(2) *Revelation of Form* is a function that is easily ignored and overlooked. When plays are lighted with general illumination alone, actors, properties, and pieces of scenery all look flat and uninteresting. There are no high lights, no shadows, no variety in the distribution of light. The walls of a set have as much light on them as the actors' faces have, and in fact, every object, every surface is at the same level of illumination. This is anything but form-revealing light. In order for objects to appear in their natural form, the distribution of light must have a high degree of variety produced by light of different levels of illumination. In the first place there must be form-revealing, that is, shadow-producing light called specific illumination. Appia said that shade and shadow are equal in importance to light itself. In one of the note books of Leonardo da Vinci there appears a pertinent comment some-



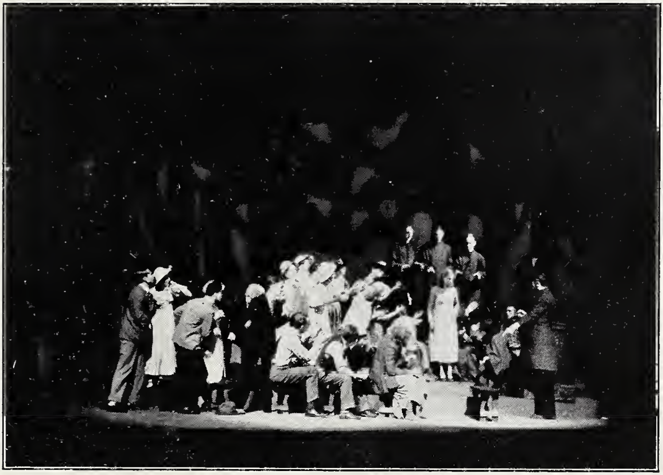


Fig. 1. The last scene of the University of Iowa's première production of Paul Green's *Tread the Green Grass.* Directed by Vance Morton, designed by A. S. Gillette and Mildred Sutherland and lighted by H. D. Sellman.

Fig. 2. A scene representing the church in the forest, from the same production. The tree projection was made with two Linnebach projectors.

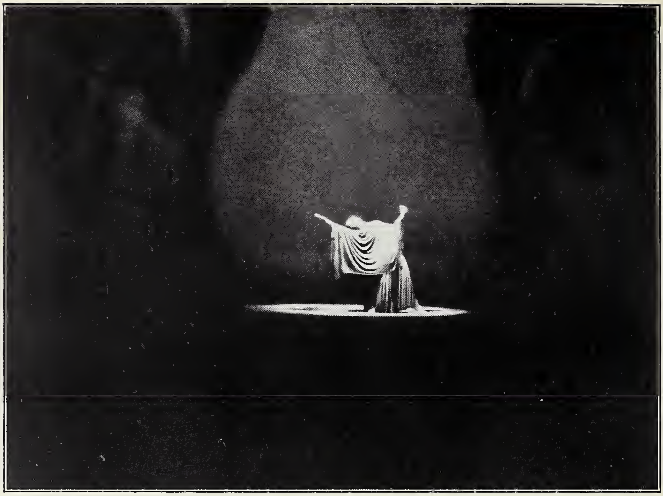


Fig. 16. A Linnebach projection and plaster dome or cyclorama used as a background for a dance.

thing like this, "Shadow is the withholding of light. It seems to me that shadows are of supreme importance in perspective, seeing that without them opaque objects and solid bodies will be indistinct both as to what lies within their boundaries and also as to their boundaries themselves. Consequently I treat of shadow and say in this connection that every opaque body is surrounded and has its surface clothed with shadows and light." And again, "Excess of light makes things seem hard; and too much darkness does not admit of our seeing them. The mean is excellent." This function, then, revelation of form, can be accomplished by specific illumination, light from specific directions balanced by shade, shadow, and areas of different degrees of brightness with some variety in color.

(3) *Representation of Nature* includes time, locale, season, and the creation of the illusion of special kinds of light. According to the demands of the play the hard shafts of a tropical sun, a cold northern light, or romantic moonlight can be produced, not with naturalistic accuracy (such accuracy is always unnecessary) but with good taste and sufficient illusion to suggest reality without "stealing the show." Illusion can be improved by a natural angle for the sun or moon, normal shadows of the actors, and shadow foliage patterns on the walls of buildings. The color of sunlight should be light amber, that of moonlight, blue-green and daylight blue.

(4) *Scenic Composition* is the use of light as an element in design in space. If one turns a borderlight and footlights on three walls and a few pieces of furniture, he illuminates a box set and the first function, visibility, may be accomplished. But if one builds into space, according to the principles of good design, a distribution with variations in quantity and color, he is approaching the art of lighting. This requires general illumination of the right tonality and quantity; it requires specific illumination at an angle best suited to each object, so that the highlights are accurately placed and so that the shadows are massed and formed as a part of the design. Shadow patterns, too, are useful for design as well as for representations of nature. Design in light is not static like an oil or water color, but is a mobile painting in space, changing continually and following the drama as an accompani-

ment. Lighting should point the focus of attention and build a new design with every movement of the actors. Without light design is lost and without design lighting is only illumination.

(5) *The Emotional* and *Psychological Function* is perhaps the most difficult one to accomplish. Training in psychology is useful, but a combination of good judgment and experience with audiences is indispensable. Color for this function was mentioned above (see Sec. 3), but light and shade are equally important.

Very dim light, or darkness with light on a single figure gives an audience the feeling of mystery, impending disaster, or the presence of the supernatural. Spirits from another world have a way of preferring the darkness, returning to us at night, glowing dimly from within by means of luminous paint, or they are often followed about by a mysterious dim light. In *The Return of Peter Grimm,* Peter comes back from the dead to wander about the house at night followed by a spotlight which illuminates little more than his face. Likewise, by changes in distribution, that is, by difference in light and shade, and by producing certain kinds of shadows, we multiply the opportunity of affecting the audience emotionally. How much more effective it is to see the slightly distorted or enlarged shadow of a crook slinking along a wall rather than to see the figure of the crook himself. What is the effect of the shadow of a noose appearing on a prison cell wall just above the head of a prisoner? The shadow of a cross in a religious play can serve both a pictorial and an emotional purpose. Occasionally when a play calls for a murder or violent death on stage, the scene might be softened and presented in better taste by allowing the audience to see only the shadows of the action. A lynching scene done in this manner could be made less objectionable but sufficiently emotional and terrible for any audience. Audiences are not hard to please in this matter. In attempting to carry out this function errors are more often made in the direction of being too complex rather than too simple.

In short, an analysis of stage lighting can be expressed in this simple statement. There are two kinds of light that can be controlled in three ways (controllable properties) in order to accomplish the five functions. Nearly everything else to be said on the subject of stage lighting is an elaboration or a detailed discussion and explanation of this analysis. The following chapters present a picture of the apparatus needed and a way in which it may be used effectively.

CHAPTER II

A LIGHTING PLAN

1. *Introduction*

Without complete detail concerning methods and practice of lighting specific plays, a general plan in outline, at least, will make the recommendations in the discussion of lighting instruments more reasonable and better understood. The application of this plan to specific plays will follow the description and use of instruments and their control. While the lighting plan discussed here requires more equipment than many little theatres have, it can be modified or simplified according to the means of any theatre, as will be discussed later. This scheme will serve also as a guide in the selection of lighting instruments to be purchased in the future. Many producing groups buy foolishly and haphazardly, because they do not know what they are working toward, but when they have learned an effective method of lighting their plays, they can purchase instruments from time to time more intelligently.

Although the plan to be explained is not as simple as lighting a set with footlights and borderlights only, the results are so far superior to this antiquated method that comparison would be odious. This plan is as simple as a high degree of flexibility will permit and as unpretentious as possible for accomplishing the function of light for an average production. Although there may be other satisfactory lighting methods, the one discussed here is in common use in many theatres where superior lighting is done.

2. *The Balance of Specific and General Illumination*

In lighting the acting area two kinds of illumination are necessary, specific and general. As was mentioned before (Chap. I), specific illumination gives us variety, and because it is shadow-producing, it is also form-revealing. In contrast to this, general illumination softens shade and shadow, modifies excessive contrasts in specific illumination and produces a general tonality over the whole area.

If the actor were static, like a piece of statuary, lighting him effectively would be comparatively simple. After studying a static pose, one would place a source of specific illumination at the ideal horizontal and vertical angle that would cause areas of shade and shadow to fall in the most effective relationship with highlights. Then one would add general illumination of just the right amount to soften the contrast between highlight, shade, and shadow and to produce a desirable color tonality in the areas of less illumination. In this way, then, a single actor remaining immobile in one area might be effectively lighted; but alas, the problem is not so simple. The actor is in almost constant movement within an area, and he ordinarily uses all of the areas in a setting. Thus a degree of complexity is introduced.

3. *Instruments for Specific Illumination*

A large number of instruments might seem to be necessary to produce specific illumination from various angles, according to the position of the actor; but this is impracticable for reasons that will soon be obvious. Two instruments separated by a horizontal angle of about forty-five degrees (the size of this angle is controlled to a considerable extent by physical conditions) will light the actor adequately in a single area. Since the stage is commonly divided into six areas, a total of twelve instruments is needed for the specific illumination on the whole acting area (see Fig. 3). The down-stage areas are properly lighted from a position in the auditorium ceiling. Because the instruments for these areas are often placed in false beams that form a part of the auditorium ceiling, they are ordinarily called beam lights. The vertical angle at which the light from these sources strikes the acting area varies from thirty-five to sixty degrees. The ideal for these instruments has been considered to be an angle of thirty-eight degrees, but there are a number of circumstances which influence one in choosing the right angle. He may be limited by the building; the distance from the source to the stage may be greater than the efficiency of a spotlight will permit; and an angle as low as thirty-five degrees may make shadows of the actors on the wall of the set unless the set is very deep. If, however, no footlights are used, the vertical angle of the beam lights should not be over forty degrees, because a higher angle will make the shadows and shade too dark in the eye sockets and under the nose and chin. If the set is shallow and footlights are available, an angle of approximately fifty-five degrees is satisfactory. At this angle shadows on the rear wall are eliminated, and the deep facial shadows can be softened with the general illumination from footlights. On the other hand, a low teaser height may require a very low beam angle. In any case, footlights are necessary when players wear hats with broad brims. Instruments to be used as beam lights should be large spotlights (with eight inch lenses) sufficiently well ventilated to use 1000 watt or 1500 watt lamps (see Chap. III and exception on page 291).

Similar circumstances obtain in the up-stage area, and six instruments are used to cover these three areas just as they are on the downstage areas. In this case, however, the vertical and horizontal angles are both much larger and the length of throw is considerably shorter. The upper diagram in Fig. 3 and the light plot in Fig. 33 show the two common mounting positions for the instruments covering the up-stage areas. In either case the instruments are mounted on the teaser batten, that is, in the position farthest down stage next to the teaser. This batten ordinarily hangs about as high as the ceiling of the set. Shadows of the actors and areas of greater brightness on the walls of the set are inevitable if the actors play close to the walls. These shadows, as well as those in the faces of the players, are modified in part by general illumination from striplights on this teaser batten (see Fig. 3). General illumination from these same striplights helps also to smooth out the spottiness on the acting area from all of the twelve instruments producing specific illumination.

Separate control of each of these twelve instruments allows considerable flexibility and variety in the distribution. In this way,

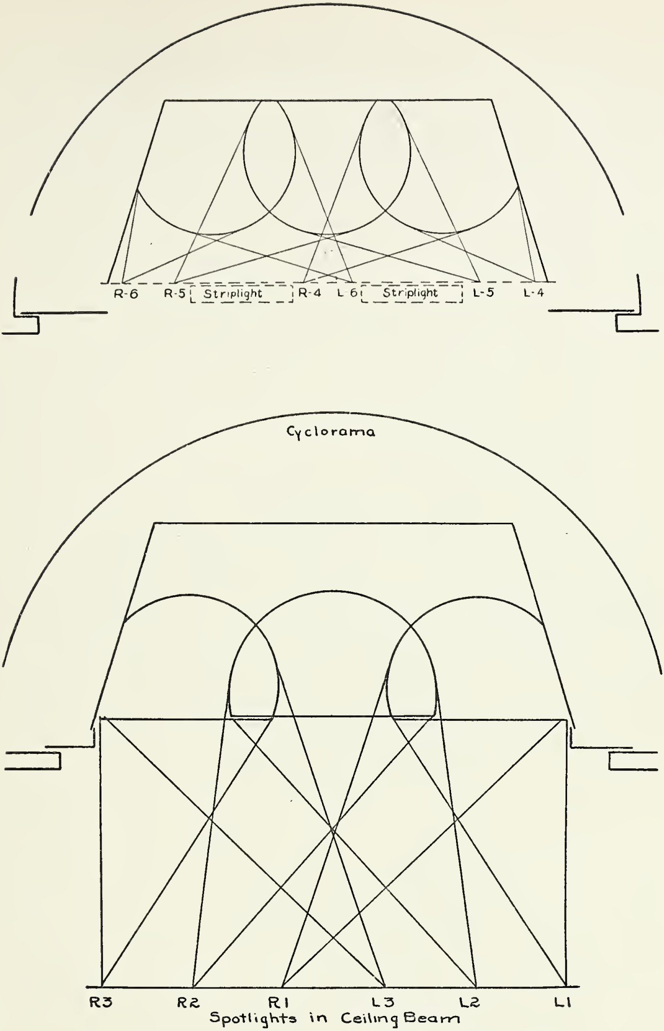

R-6
R-5
Striplight
R-4
L-6
Striplight
L-5
L-4
Cyclorama
R3
R2
R1
L3
L2
L1
Spotlights in Ceiling Beam

Fig. 3. Diagram of General Lighting Plan

any area can be brought into prominence or reduced to obscurity by changes in quantity of illumination. Variety in color is often obtained by having one cool color and one warm one in the two instruments on a single area. If moonlight is coming through windows on one side, then the instruments covering the acting area from that direction should produce the cool light also. Pink, Illusion Pink, Natural, Light Violet, Light Amber, and Daylight Blue are the most useful acting area color media (See Chap. III, Sect. 14). Since general illumination from both footlights and the striplights on the teaser batten affect the tonality of the walls of the set, the color of this light must be determined by the color of the set.

4. *Motivation for Lighting*

In interiors illuminated by artificial light, floor lamps, table lamps, candles, and other sources very low in intensity in themselves, serve as motivation for areas of higher illumination and variations in color, that is, variety in the whole distribution. Other motivating sources of natural light, such as sunlight, can be produced by spotlights or reflectors producing parallel rays. These may add to the visibility at times but are useful chiefly to produce highlights and to justify the use of color and increased amounts of illumination at certain places on the acting area. In this way such sources of light accomplish several functions at the same time.

All visible sources of light, such as table and floor lamps, bracket lamps, candles, lanterns, and torches, should contain small incandescent lamps of very low wattage. Nothing is more annoying to an audience than to be forced to look at a bright source of light on the stage. Obviously, any lighting instrument must be so masked that it is not visible from any seat in the house.

Around the set, in backings, illumination should be less than on the acting area; in these locations striplights in short lengths of one to three feet are adequate. They can be attached to the set itself. These striplights, moreover, are very useful on the floor to illuminate groundrows.

5. *Lighting the Walls of a Set*

The actual walls of a set should have very little light on them, probably not more than from a twentieth to a twenty-fifth part of the light on the acting area. This keeps the emphasis and the attention of the audience on the actors instead of on the background. Disregarding the important matter of relative emphasis, one would be quickly fatigued by looking at large areas of bright light. In fact, a good play could fail because the set was as bright as the acting area. An important reason why illuminating a play by means of borderlights and footlights alone is wrong is that the background receives the same light that the actors receive. Since light walls actually reflect more light than the average make-up, the walls have a greater brightness than the actors' faces. It is, however, often necessary to increase the amount of illumination on the walls beyond an appropriate degree. For example, if actors play very close to the walls, the specific illumination must be high enough for adequate visibility, and this will cause spottiness on the walls which will have to be smoothed out by increasing the general illumination. Even if this objectionable increase is necessary, the upper part of the set can be kept darker by directing the striplights down. Then, only footlighting will fall on the upper portion of the walls. Since this light is dim, it will add a pleasing color tonality to the set without making it too light. In general, one should always so regulate and distribute the light on the setting that the intensity decreases gradually from the bottom to the top.

6. *Background Lighting*

The last element to be considered in the setting is the background. For purposes of this discussion there will be included under this classification cycloramas, drops, and in spite of their bad repute, borders and wings. A cyclorama is the most difficult element in the setting to light effectively, probably because stage space is nearly always so limited that instruments have to be placed too close to the surface of the cyclorama. This condition makes an even distribution very difficult to attain.

While a cyclorama is ordinarily made to extend around the stage from an off-stage position near one side of the proscenium arch to a similar position on the other side of the stage, it is rarely necessary that the whole of it be lighted at once. From a half to two-thirds of the surface is as much as one commonly uses for any one play. This simplifies matters a little (at least fewer instruments are needed), but if one can light a section of the cyclorama ten feet wide effectively, he can certainly light the whole, provided the necessary number of instruments is available. The whole problem, then, is just that of producing general illumination evenly distributed over a smooth surface. Of course, variations in intensity and color in this distribution are necessary. The base of the cyclorama, including an area extending about ten or twelve feet up, can be lighted best by short striplights from six to ten feet long. Such instruments with a maximum wattage in each lamp of 150 with the reflectors on six-inch centers (see Chap. III, Sect. 3) are the right size for all cyclorama base lighting in common practice in little theatres. Per running foot, one needs approximately 100 watts of blue, 65 watts of green, and 65 watts of red. Employing an instrument with reflectors on six-inch centers, one needs 150 watt lamps for blue and 100 watt lamps each for green and red. With such instruments color mixing is close to the instrument, so that an eighteen inch groundrow is high enough to mask the mixing, and the instrument can be placed within a foot of the cyclorama surface. For a better distribution of light, however, the instruments should be from three to six feet from the surface. Larger instruments can be used where greater wattage is necessary, if space allows them to be placed six feet from the surface and if taller groundrows are used to mask them. This condition will obtain in large theatres only. The reader is no doubt familiar with the fact that these instruments produce the changes in color necessary for sunsets and sunrises. By the use of the primary colors in three circuits, subtle changes in brilliance and color can be made at the controlboard to produce very beautiful sunrises and sunsets of the cloudless variety. The short striplights are connected end to end in an arc-like formation in front of the cyclorama.

The upper part of the cyclorama is lighted by floodlights mounted on a batten or frame as explained in Chapter IV. To accomplish changes from daylight to night or vice versa it is necessary to have these in two circuits. If space is limited and the instruments have to be within five or six feet of the surface, they must be very close together in a row with every other instrument on the same circuit. A more nearly even distribution can be acquired, however, if the instruments are placed fifteen or twenty feet from the surface lighted. Floodlights of 500 watts are large enough for almost any cyclorama.

Again in the case of cycloramas, we find the errors in lighting on the side of too much light rather than too little. Like the walls of a set, the cyclorama needs no more than between a twenty-fifth and a fiftieth of the illumination on the acting area. In color the daylight sky can be produced with a daylight blue gelatine or a combination of cellophane (see Chap. IV). It should be neither toward the green nor toward the violet. A pure dark blue is hard to obtain in cheap color media, but for a night sky the medium must be neither green-blue nor purple. Only a strictly pure blue, so far as the eye is concerned, will carry the illusion of the sky. One rarely sees a stage sky dim enough and of the proper hue.

While only sky cycloramas have been discussed above, any surface that partly encloses the acting area of the stage might, generally speaking, be called a cyclorama. In fact a drapery of monks cloth, velour, or any other material hung in folds might be considered in this general class. The method of lighting these is much the same as that described above, but much more variety in color is often used over the whole surface depending on the purpose to which the drapery is put. Floodlights on stands are used as supplementary sources if the height of the material is not more than twelve or fourteen feet. Flat surfaces of material hung from battens, called drops, are really substitutes for cycloramas. When a drop is used as a sky backing, the lighting is done according to the method described above. On the other hand, in producing plays of the nineteenth century or earlier, painted drops, wings, and borders are often made a part of the setting if the play is done in the style of its original production. These drops and their companions, the wings and the borders, look best if lighted by dim general illumination produced with the most convenient instrument for that purpose. One should avoid getting shadows on them because of the incongruity of these and the painted shadows; the simplest way is to keep the actors away from the scenery.

In this brief chapter an outline of the lighting plan recommended in this book is presented for definite reasons. One needs to have a general idea or a perspective view of the whole problem of lighting a play before plunging into details of lighting instruments and lighting control. After one has finished the study of these details and feels more at home with these instruments, he will be better able to continue the discussion of methods and practice in stage lighting according to the plan outlined here. Chapter VI continues and concludes the subject discussed in the present chapter (Chap. II).

CHAPTER III

LIGHTING INSTRUMENTS

1. *Introduction*

It is unfortunate that directors in school and community theatres often allow salesmen from scenic studios and lighting equipment companies to select lighting equipment for them. Usually the salesman is looked upon as an authority, and a considerable amount of money is wasted on the purchase of three or four borderlights and proscenium striplights that are obsolete in design and of very little use for the sort of production common in school theatres. Everyone knows that a salesman's primary interest is in selling his own product, and he is never in a position to know exactly what a particular theatre needs most. Only those who work in that theatre and who are properly trained are likely to know. Experience, training, and shrewd buying will triumph over high-powered salesmanship, and the only substitute for these three essentials is authoritative and unbiased technical advice. Because one manufacturer makes the best spotlights, it does not follow that his floodlights are equally good. And again, the idea of buying three borderlights instead of one in the hope of multiplying the opportunities for good lighting has about as much basis in fact as the notion that three pills will cure one more quickly than a single pill. Accordingly, the purpose of this chapter is to prevent this sort of mistake and to discuss the best in available apparatus, so that directors and technical workers will be able to select lighting instruments more intelligently and handle them more effectively.

For purposes of discussion we shall classify everything used in stage lighting as (1) Instruments, (2) Accessories, (3) Control Equipment. In the present chapter, numbers one and two will be discussed, and in Chapter V the third will be considered. Instruments will be considered under these headings: spotlights, striplights, floodlights, special instruments, and accessories.

2. *Spotlights*

A good spotlight should consist of several thoughtfully designed and well fabricated parts. First, it needs a strong, light sheetmetal hood, well ventilated and properly reinforced with cast or rolled steel. The size of the hood is determined by a number of factors, but it should be as small as is practicable, allowing just sufficient length to focus sharply a lens of the longest focal length needed for the applications of this instrument. In professional practice the access door (for removing or replacing the lamp) has been placed on either side, top, bottom, front, or rear. For spotlights to be

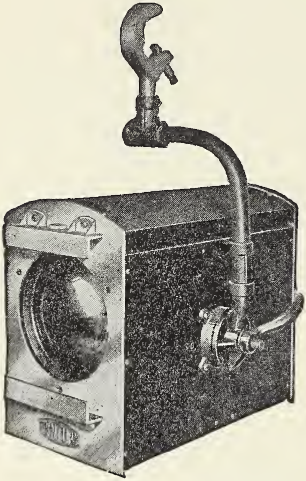


FIG. 4. CENTURY 1000-WATT SPOTLIGHT

With off-set suspension arm which overcomes the difficulty of the eccentric load on the usual straight arm.

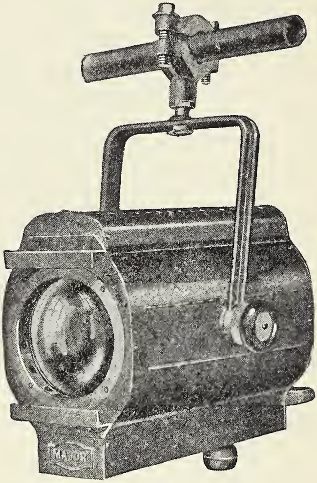


FIG. 5. MAJOR 1000-WATT SPOTLIGHT

Slightly different design with yoke and pipe clamp.

used in the ceiling of the auditorium the rear access door is preferable; for a teaser spotlight, that is, one hanging from a batten behind the teaser, a front door is much more convenient if the instrument is adjusted from a ladder on the floor. This is an illustration of the difficulties attendant upon building a universally applicable instrument.

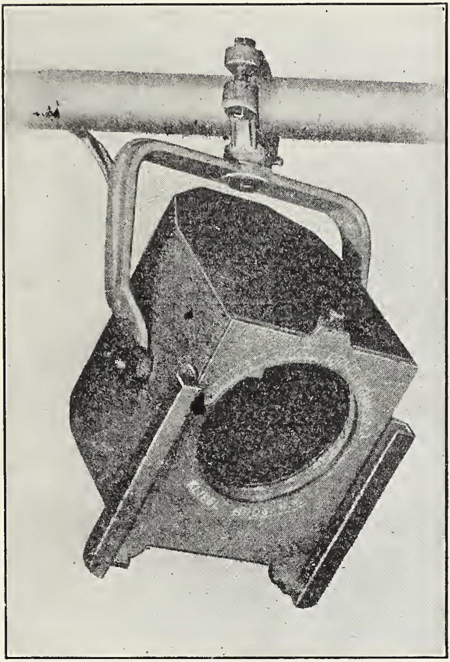


Fig. 6. Baby Spotlight with Removable Front to Use as a Small Floodlight. One of the Best

The focusing slide, lamp socket, and reflector should be a unit assembly which will slide easily within the hood and which can be quickly and easily set in any position. Strips of metal placed under the receptacle, which move with this assembly, are necessary to prevent light from spilling through the slot in the bottom of the hood.

Reflectors: The light that falls on the lens is actually a very small part of the total output of a spotlight lamp; so a spherical reflector is mounted directly behind the lamp socket, mentioned above, to increase the efficiency about forty per cent. This reflector must have a regular reflecting surface, such as polished chromium, polished aluminum, or silver-backed glass, so that light falling upon it will return directly to the center of curvature when the reflector is properly focused with the center of curvature at the center of the lamp filament. If the reflector mounting is designed to allow the reflector to rest in the proper focal position only, many difficulties are prevented.

Lenses: Spotlight lenses are of the plano-convex type which means that it has one plane surface and one convex surface. These lenses are designated by their diameter and focal length, such as a 6 x 10 lens or a 6 inch lens of 10 inch focal length. The focal point of a lens is the point to which, after passing through the lens, all parallel rays of light converge. Theoretically, if a point source of light were placed at the focus, the light passing through the lens would go forth in straight lines. Then the focal length is the distance from this point of convergence to a point within the lens. The slide range in a spotlight is within this distance. The filament of a lamp is much larger than a point, and as soon as a part of the filament gets just beyond the focus, an image of the filament appears on the illuminated surface. This of course is undesirable; so the focusing slide should not allow the lamp to go farther than half an inch in front of the focus. On the other hand, the forward limit of the slide is determined by the size of the lamp, since the bulb of the lamp should approach the lens not closer than approximately three-eighths of an inch. For highest efficiency and proper distribution, lens, lamp, and reflector must be in optical alignment. In other words, a line perpendicular to the plane face of the lens and passing through the center must also pass through the center of the lamp filament and the center of the reflector.

Lenses used for spotlights are crude, uncorrected pieces of crown glass, unsatisfactory for optical work but quite adequate for theatrical purposes. The most useful diameters in spotlight lenses are 4½ inches, 6 inches and 8 inches. Focal lengths depend upon the purpose to which the lens is to be put, but there are practical difficulties in the way of making and using very thick lenses, that is, lenses of short focal length. This eliminates very short focal lengths in the six and eight inch diameters. In general one should choose short focal length lenses for short throws and long focal length lenses for long throws. The useful lengths for 4½ inch lenses are 6 inches to 7½ inches, for 6 inch lenses, 7½

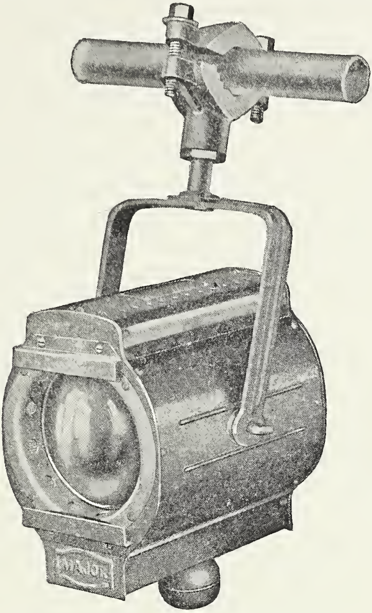


Fig. 7. One of the Best Baby Spotlights

Shown with yoke and pipe clamp.

inches to 10 inches, and for 8 inch lenses, 10 inches to 12 inches focal length. The longer the focal length, the smaller the illuminated area can be made without producing a filament image, but as focal length increases, efficiency decreases. For example, to produce equally illuminated areas the lamp must be farther from a lens of twelve inches focal length than from one of ten inches, for as anyone can see, more light goes through the lens when the lamp is close to it than when it is eight or ten inches away. For example two 6 inch lens spotlights, identical in every way except that one has an 8 inch focal length and the other has a 12 inch, produce equally illuminated areas of light. The lamp in the instrument with longer focal length is 7 inches behind the lens and in the shorter, the lamp is 5 inches behind the lens. Because of the relative positions of the lamps, the instrument with the 8 inch focal length lens is producing about sixty-five per cent more light than the other. The loss of light in the lens itself is about ten to twelve per cent including both transmission and reflection. The diameter, also, is an important factor in efficiency. Wherever space permits, an 8 inch lens spotlight should be used in preference to a 6 inch one because an 8 inch lens allows much more light to pass than a 6 inch when the lamp in each case is the same distance behind the lens.

Mounting: All good spotlights are designed for mounting either on a floor stand or with a yoke or suspension arm for mounting on a pipe batten (see Figs. 4 and 5). Since the suspension arm supports the instrument on one side only, the yoke, which supports the instrument from both sides is a preferable method of mounting. To fasten the yoke or arm to a pipe batten one of two kinds of clamps is used. The two part jaw clamp illustrated in Fig. 5 permits a firmer grip than that shown in Fig. 4, but many of the latter are in use.

Color Frame Guides: Adequate guides for color frames should be provided on the instrument. Those shown in Figs. 4 and 5 are in almost universal use, but they are far from the best method of holding a frame. If the frame fits loosely it may fall out on the head of an actor or person in the audience; if a spring clip is provided, the instrument may easily be pulled out of focus when the color frame is changed. A much more effective frame holder is closed at the bottom and both sides and open at the top, as in Fig. 6. In this case frames can be changed quickly without jarring the instrument and there is no danger of their falling out.

Baby Spotlights: Baby spotlights are designed to produce a concentrated beam (specific illumination) of low and medium intensity under circumstances where larger instruments could not be mounted or concealed. They are made with a medium base receptacle for 250 watt or 400 watt lamps for spotlight service, but many of the instruments are not ventilated sufficiently for the larger wattage. If they are used for many purposes this may be a disadvantage. Major (Fig. 7) and Century spotlights are made for both wattages. Those manufactured by Century and Kliegl (Fig. 6) have removable front doors, making them useful as small floodlights, as well as spotlights. A prospective purchaser should be certain that the instrument has a reflector and that the lens is either 4½ or 5 inches in diameter. Some baby spotlights have smaller lenses and are accordingly less efficient.

Larger Spotlights: The larger spotlights (Figs. 4 and 5) are provided with mogul receptacles for 500 watt, 1000 watt or even for larger spotlight lamps if the instrument is sufficiently ventilated for the heat of larger lamps. Instruments of this size are equipped with either 6 or 8 inch lenses, and are in common use for acting area instruments mounted in the auditorium ceiling or on the teaser batten. They are occasionally used on floor stands. While effect machines (see Sect. 5) are generally made to fit on a 6 inch lens spotlight, for all other purposes where space permits an 8 inch lens instrument is preferable for the reasons mentioned above. Receptacles in nearly all spotlights manufactured in the past year or two, especially the large spotlights, are of the pre-focus type. These can be used with lamps of pre-focus base only. With this base the lamp does not screw in but is pushed in and turned a quarter turn, so that the lamp filament will be properly related to the reflector and lens.

There is a special spotlight worthy of mention called by its

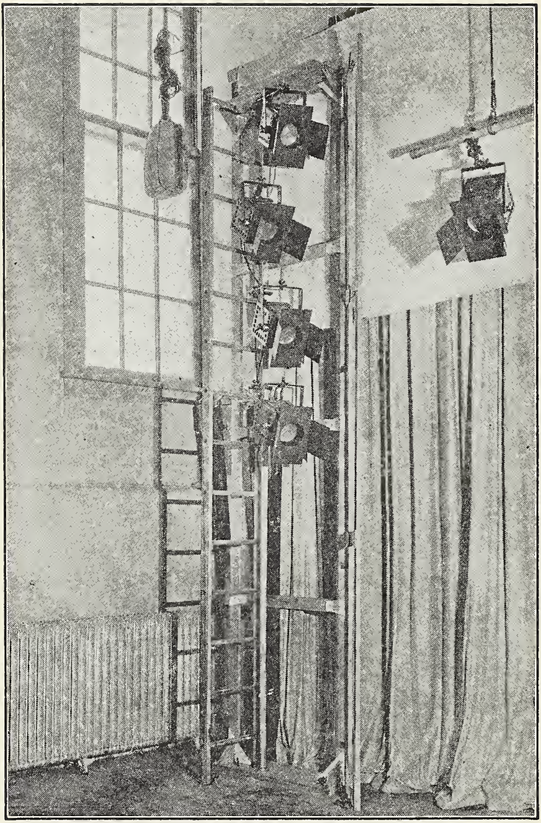


FIG. 8. A CORNER OF THE STAGE IN THE PLAYMAKERS THEATRE, UNIVERSITY OF NORTH CAROLINA

Showing Tormentor Hoods (spotlights) mounted on Tormentor batten.

manufacturer, Pevear Color Specialty Co., a tormentor hood. It is a cube-shaped instrument (see Fig. 8) with a medium base receptacle for 400 watt spotlight lamps, and a removable lens unit. Without the lens it can be used as a small floodlight in the manner of the baby spotlights. Its 6 inch lens is mounted in a short cylinder with metal flippers that can be moved about to cut off a portion of the beam of light. The reflector, unfortunately, is fastened to the rear end of the hood, so that it is not always in focus. This instrument, as its name implies, is intended primarily to be mounted on a vertical batten, and it is equipped with a yoke and accessories for this purpose though it may be mounted in the manner of other instruments, too. The Pevear Tormentor Hood is a useful and versatile instrument but is rather expensive.

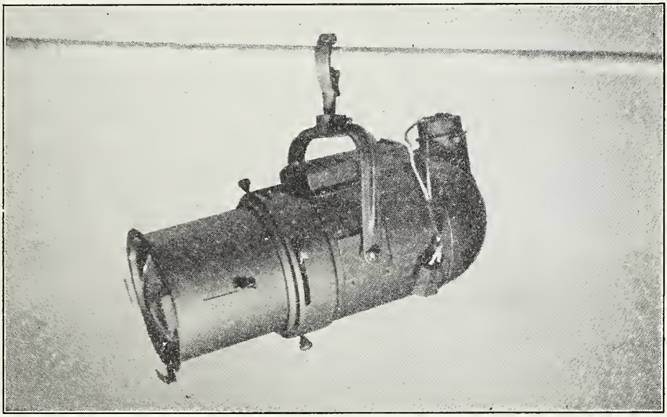


Fig. 9. Ellipsoidal Spotlight

Ellipsoidal Spotlights: The newest development in spotlights is one which contains an ellipsoidal reflector (see Fig. 9). It is somewhat longer than the conventional spotlight and is made for fairly long throws. The important advance in this apparatus is in efficiency, since, with the same wattage, it produces from three to five times as much illumination as the conventional spotlight. Instead of allowing most of the light to spill into the hood, as in the older ones, the ellipsoidal reflector gathers a larger part of the illumination and sends it through the lens. The efficiency is gained, however, at the expense of focusing. Very little change can be made in the size of illuminated area; so a lens is selected for definite conditions of use. In other words for any given length of throw, changes in the size of illuminated area are made by changing the focal length of the lens. Their most useful work will be as beam spotlights or for the front of a balcony. Both Century and Kliegl have placed framing shutters in their ellipsoidal spotlights that greatly aid in controlling the size and shape of the illuminated area. These, of course, act in the same way as pieces of cardboard placed in a color frame. Obviously, the mechanical framing shutters are more convenient.

There are so many manufacturers and dealers in lighting equipment that the prospective purchaser must be ever on his guard to keep from dealing with those who do not keep up with the constant improvement that obtains among the few progressive manufacturers. Much obsolete apparatus is on the market.

3. *Striplights*

The now obsolete type of striplight, commonly sold along with better types by many dealers even today, consists of a metal trough reflector usually painted white with one or two rows of lamps placed in front of it. The shape of the reflector section mattered very little, for its purpose was evidently no other than to send the light backstage rather than out front. Controlling light for a carefully planned distribution was unknown when this striplight was the last word in lighting instruments some thirty years ago. The disadvantages, compared with modern striplights, lie in its inefficient reflection, in its improper distribution, and in the passage of light of one color through lamps of another color. Now the writer does not mean to infer that striplights of the kind just mentioned are of absolutely no use and should be immediately discarded. If one has unfortunately fallen heir to one or more of these, the chances are good that he needs other things before he should replace the striplights. If they are properly wired in three or four circuits and used for supplementary lighting of low intensity, they can serve a very useful purpose even if they are inferior. The warning is essentially against purchasing new ones of this class when much better striplights are available.

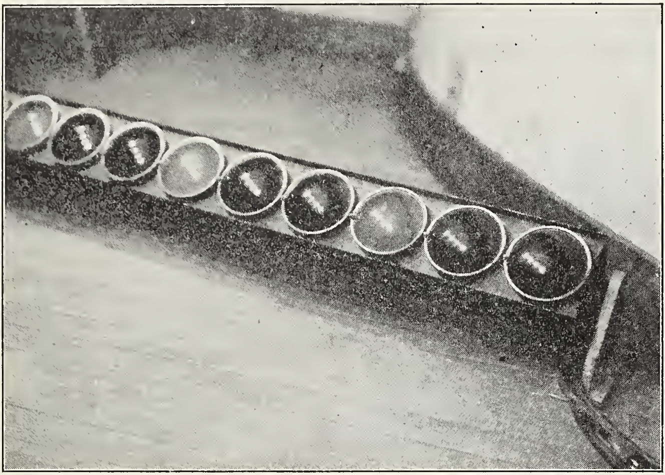


Fig. 10. Striplight

The best striplight unit (Fig. 10) consists of a row of individual reflectors each containing one lamp and a round glass color medium that completely covers the mouth of the reflector. The reflecting surface may be polished chromium or polished or etched aluminum. Aluminum has a considerably higher reflection factor.[1] The etched variety tends to spread the light a little more than the polished surface. The shape of the reflector is a combination of parabolic and spherical, which seems to produce the best distribution in striplights. The reflector of parabolic shape tends to send out light in straight lines if the source is placed at the focus. A spherical reflector was explained above (see Sect. 2). Striplights should be wired in three or four circuits for the three primary colors blue, green, and red (see Chap. IV) and possibly one for white light. The color roundels which are placed in the mouth of the reflector are of heavy heat-resisting glass, which cannot easily be broken unless they are thrown at the stage-manager. These color media are readily interchangeable. Reputable dealers carry five or six colors in stock.

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[1] The reflection factor is the amount of light reflected from a surface divided by the light falling on it. It is usually expressed in per cent.

The purpose of striplights is to produce general illumination, but modern reflector design produces a wedge-like distribution of light rather than light spilling all over the stage, as was the case in the older striplights.

Borderlights: A borderlight is just a striplight hanging from a pipe batten overhead to produce general illumination on the acting area from above. Since the new striplight will produce a wedge of light, the light can be restricted in part to certain areas. For example, by tipping the borderlight downward most of the illumination can be kept off the scenery, or any part of the light can be directed to the set by rotating the instrument around its axis. The method of mounting is commonly by chains. More accurate manipulations is possible, however, by mounting the instrument with short arms and pipe clamps, one at each end in a similar manner to the arm and clamp method of mounting a spotlight. Borderlights with individual reflectors are made for lamps from 75 watts to 500 watts, but 75 watts to 150 watts is sufficiently large for the average little theatre, because the three small sizes, 75, 100, and 150 watts can be placed on six-inch centers, and it is preferable to have like colors near each other to make the distribution as nearly even as possible. An instrument with 150 watt lamps is composed of reflectors on six-inch centers, while one with 200 watt lamps is on eight-inch centers. There is exactly the same wattage and illumination per foot, but the units of the same color are six inches farther apart in the larger one, and the larger one is more expensive—two disadvantages.

For the production of plays it is unnecessary to have a borderlight extend from one side of the proscenium to the other. For a proscenium opening of thirty to thirty-six feet a borderlight of twelve to sixteen feet is generally long enough and might better be divided into two six or eight-foot sections so that spotlights can be placed between them when needed. Furthermore, in play production it is not necessary to have several borderlights. Two sections like those mentioned above are sufficient and these should not be connected permanently, but should be provided with pin connecters (see Sect. 8), as are spotlights, to be connected when the instrument is needed.

Striplights: This term is used in referring not only to the general class, but also to short sections from two to six feet long containing lamps of small wattage. Three or four of these will be very useful for providing general illumination in backings for doors and windows, behind ground rows, and in similar places.

Footlights: Usually footlights consist of a striplight concealed from the house by proper recession near the edge of the stage floor outside the curtain line. They should be of very low wattage and should not be longer than three-fourths of the width of the proscenium arch. Footlights need to be carefully placed to avoid spilling light on the proscenium arch or on the teaser when it is at its lowest useful position. They should not be placed higher than three and one-half inches above the stage floor. Like other striplights they might well be made in six or eight-foot sections, so that only part of them need be used at a time. Again like striplights they should be wired in three circuits for the primary colors. The same colors should not be farther apart than eighteen inches, in order that color mixing will be close, and spottiness will not obtain when only one color is in use.

Since the illumination from footlights is directed upward, as well as backstage, large shadows are likely to appear on scenery, because each source of light produces a shadow of every object in front of it. This is one of the most objectionable characteristics of ordinary footlights, but the difficulty can be overcome by reversing the striplight to send its illumination in the direction of the audience. To receive this illumination a long trough-like but properly shaped (spherical is a desirable shape) reflector of etched aluminum is provided to direct the illumination back to the stage. This reflector acts as a line source of light that does not produce shadows of objects that stand perpendicularly to it as the actor does. In this manner, then, indirect footlights solve the problem of annoying footlight shadows.

Most of the epithets hurled at footlights come as a result of their being used as a primary source of light, but this criticism does not apply to footlights of good design in use for their intended purpose. Color in footlight illumination adds something to the general tonality of the setting, but their primary purpose is to soften facial shadows and diminish excessive contrasts in the actors' faces caused by specific illumination from beam spotlights placed in the auditorium ceiling. This function requires illumination of a very low level and is akin to the function of borderlights and any other source of general illumination—that of blending and reducing contrasts in the distribution of specific illumination from spotlights. One can do very well without footlights if the angle of spotlights in the auditorium ceiling is fairly low, thirty-five to forty degrees, except when actors wear broad-brimmed hats. If this angle is about sixty degrees, footlights are necessary in any case. They are, however, more often too bright than too dim.

4. *Floodlights*

The old olivette style floodlight shown in Fig. 11, was a sheet metal box with a mogul receptacle for a lamp of large wattage. The 1000 watt size was common. While these are still in use, floodlights that are more efficient, lighter, more easily mounted, and more suitable in light distribution to the needs of modern stage lighting, are now preferred by the discriminating technical workers in little theatres. Fig. 12 illustrates one of the best, which consists of a spun aluminum reflector with an etched reflecting surface, guides for the color frame to drop in at the top, mogul receptacle and a small yoke with a two-part jaw pipe clamp. The shape of this reflector is ellipsoidal,[2] but a parabolic reflector is

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[2] See any handbook of mathematics for a description of an ellipsoid. It is used in this floodlight to produce a wide but controlled spread of light near the instrument.

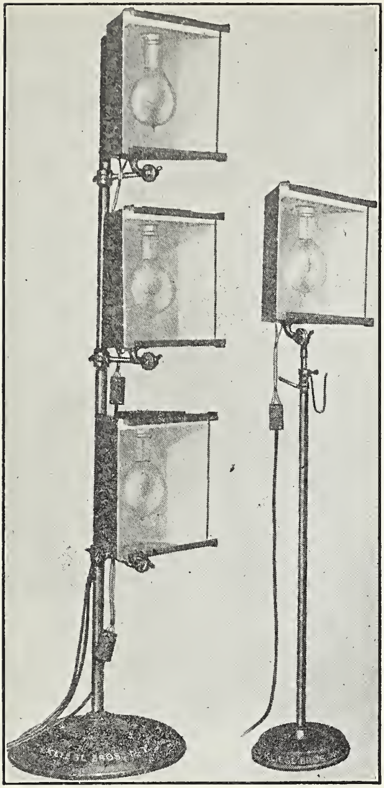

FIG. 11. OLIVETTES OR FLOODLIGHTS

more common and equally good. Most of these floodlights are made for 750 or 1000 watt lamps, but the one illustrated in Fig. 12 is smaller, being intended for a 500 watt lamp. The 500 watt size has the advantage of taking up less space in mounting and is of ample intensity for college and community theatres.

Floodlights produce general illumination similar to the distribution of one unit of a striplight. Or conversely, the illumination from a whole row of floodlights is similar to the distribution of a striplight, but probably greater in spread. Floodlights can be used interchangeably with striplights in some cases, one taking the place of a short strip for illuminating backings, several replacing a borderlight to provide the general illumination for the acting area, or most important of all their uses, in rows or groups on a batten for overhead cyclorama lighting. In this case they are more satisfactory than any other instrument for this purpose. In some cases they are mounted close together in rows on a pipe batten and connected in two circuits, one light blue and one dark blue, for changes from day to night scenes. Another method of mounting them for cyclorama lighting is on a rectangular pipe frame consisting of several horizontal pieces of pipe as well as the two vertical supports. This frame, supporting a large number of instruments, is hung fifteen or twenty feet from the cyclorama to produce a more even distribution of light over the surface than a single row closer to the surface is capable of producing. These floodlights are exceedingly useful instruments for many purposes.

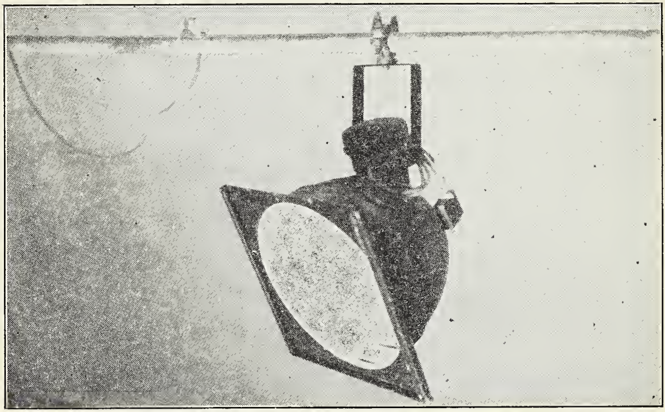

FIG. 12. KLIEGL CYCLORAMA FLOODLIGHT

5. *Special Instruments*

Lens Projections: For the projections of clouds, rain, moving objects, and painted or photographed scenes under circumstances in which detail and sharply focused images are wanted, a lens projector is necessary. It consists of an ordinary 1000 watt six-inch lens spotlight to which are attached an additional condensing lens, effect or lantern slide holder, and an objective lens (see Fig. 13 for a diagrammatic illustration). If one knows the distances and conditions under which the projected effect is to be used, he can calculate the focal length of the objective lens necessary to produce an image of the desired size. The sciopticon illustrated in Fig. 14 is an instrument for the production of moving effects. Within the circular drum is a mica disc which is turned by clockwork or motor. The effect to be projected is painted on this disc. All kinds of moving effects can be rented or purchased from the larger dealers in lighting equipment. If the effect part of the system is replaced with a slide holder, any kind of cut-out or painted lantern slide can be made to project a still effect. Flashes of zigzag lightning, stars, photographed scenes, and foliage patterns (see Fig. 34) are often done in this manner. To select the

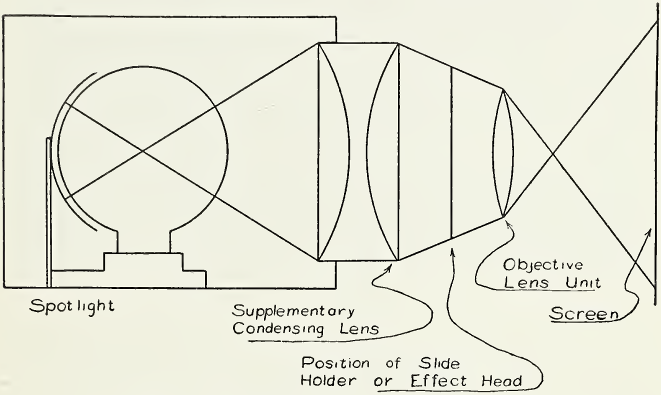
Spotlight
Supplementary Condensing Lens
Position of Slide Holder or Effect Head
Objective Lens Unit
Screen

FIG. 13. DIAGRAM OF LENS PROJECTOR

proper lenses one must be able to make the simple calculations with the lens formulas found in any elementary text in physics.

Linnebach Projectors: In projecting broad effects where detail is unimportant a Linnebach projector can be used. It consists of a large sheet metal hood with guides for the slide and a lamp receptacle within. The inside surface is painted black to prevent reflections. A spotlight lamp with concentrated filament of fairly high intensity is a necessary part of the instrument which can be mounted on a batten or stand or set on the floor. The slide may be made of glass, heavy cellophane, or cardboard with the design cut out. Sometimes the instruments are set behind a translucent drop, so that the image is visible from the opposite side, or mounted down stage overhead to project the scene over the heads of the actors. Obviously a place of mounting must be found which

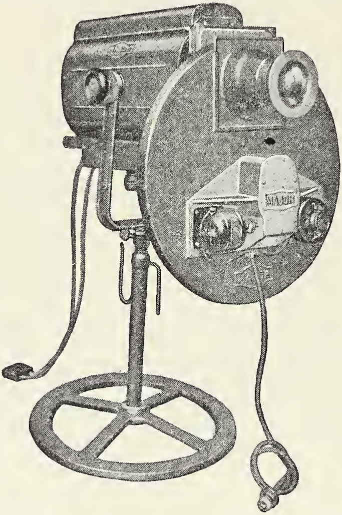

FIG. 14. SCIOPTICON OR EFFECT MACHINE EQUIPPED WITH MOTOR INSTEAD OF CLOCK MECHANISM

will prevent the actor from making a shadow on the projected image. In finding a place of mounting one is likely to introduce distortion in the image, which may be corrected by figuring geometrically the changes necessary in the slide to correct the distortion. Three Linnebachs are shown on the light bridge in Fig. 15. The two lower ones produced the forest projection in Fig. 2.

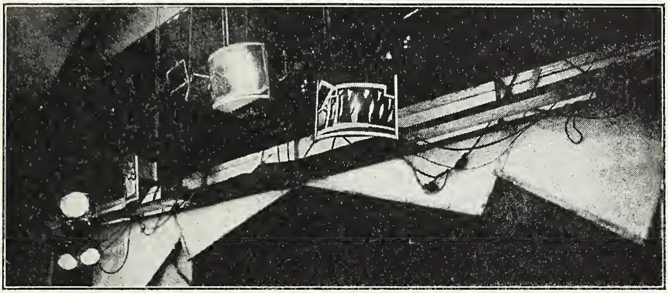

FIG. 15. LINNEBACH PROJECTORS

They were made to receive a curved slide in order to avoid distortion in projecting on a cylindrically shaped cyclorama. In using these, there was no horizontal distortion and the vertical distortion was insignificant. Linnebach projectors are very useful and effective under the right circumstances, but they are not to be used indiscriminately. At best, they have an unnatural appearance which makes them unsuitable for plays of naturalism and realism. For plays of expressionism, as a part of stylized scenery, or for supernatural effects, Linnebach projections make a valuable contribution to scenery and stage lighting.

6. *Lightning and Rainbow Effects*

A number of effects can be produced, as explained in Section 5, by means of lens projections of painted, photographic, or paper cut-out lantern slides. Examples of these are a zigzag cut-out made in a piece of black paper for flashes of expressionistic lightning, tiny holes punched in a tin slide for stars, or a hand painted slide for a rainbow. Such a rainbow is rarely convincing or beautiful; a better one can be produced by an apparatus consisting of a lens and two large glass prisms. This rainbow effect can be rented or purchased, but anyone familiar with the physics of light can assemble one for temporary use from parts found in almost any department of physics in a college or university. Lightning more naturalistic than a projected cut-out, is produced by momentary contacts between a carbon and a metal terminal.[3] The lightning effects, which are offered for sale, are properly enclosed to guard against fire. One kind is operated by hand, and another is operated by a magnet, so that it can be controlled electrically from a distance.

7. *Fireplace Effects*

Fireplaces offer opportunities for variety and beauty in lighting interior settings that are worthy of some consideration. The motivation, that is, the apparent source of light must be a dimly illuminated inconspicuous coal grate or set of fire logs, neither of which is difficult to assemble. To produce a coal grate fire, one can borrow the metal basket and fill it with chunks of amber and black glass. Beneath the basket it will be necessary to clamp two receptacles containing lamps of small wattage, which will illuminate the chunks of glass and make them seem like glowing coals. This whole unit can be purchased or borrowed from a hardware store that uses the grate for window display. Fire logs are expensive to purchase but quite simple and cheap to construct. Taking a board of suitable size and shape as a base, one first attaches two lamp receptacles and wires them to illuminate the logs. Then he makes a form from chicken wire in the shape of the group of logs, coals, and ashes and attaches it to the wooden base. Clearance, of course, must be left to allow the lamps to be placed in the receptacles. The next step is to cover the frame with *papier mâché*. One dips strips of newspaper or paper toweling in cold water paste and smoothes it into place over the frame until it is completely covered. When this dries, it will be a durable surface that will stand fairly rough treatment. To complete the logs, one punches some holes in appropriate places and covers them with cellophane, and finally paints the whole unit to resemble logs. Naturalistic detail is unnecessary since firelogs are always partly concealed and are never seen at close range. If the fireplace is in a side wall down stage, one or two baby spotlights with red and amber color media can be concealed where they can be focused on a chair or sofa to illuminate the actors in this area with the warmth of firelight in contrast, perhaps, to moonlight coming in a window. The amount of illumination from a fireplace should be rather low because of the position and angle of illumination that might produce objectionable shadows on the opposite wall.

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[3] Be certain that some resistance is in the circuit before making contact.

8. *Accessories*

Lamps: An incandescent lamp consists of a base (the part that screws into the socket or receptacle), which is made in several sizes, including mogul, medium, intermediate, candelabra, and miniature, a bulb, or jacket, of glass, the lead-in wires, the filament, and its supports. Lamps with pear-shaped (P.S.) bulbs are used in floodlights and striplights, and lamps with globular (G) shape bulbs are used in spotlights. The general public incorrectly calls a lamp a bulb, but the bulb is only a part of a lamp. The G shape lamps of 250 watts and 400 watts have a medium base; larger ones have a mogul base. With a P.S. bulb, lamp sizes up to and including 200 watts have a medium base, and sizes larger have a mogul base. P.S. lamps of 1000 watts or less can be burned in any position, but G lamps cannot be burned within 45 degrees of vertically base up. Operators must be careful in mounting spotlights to see that the lamps are burning in the proper positions because G lamps will burn out quickly if placed vertically base up. P.S. lamps have an average life of one thousand hours, while G lamps are limited to about two hundred hours. The new ellipsoidal spotlight requires a tubular lamp which burns base up. It is a new lamp made particularly for this instrument.

Color Frames: Frames for supporting color media used on spotlights, floodlights, and striplights are commonly made of sheet metal in two halves with square or round openings large enough to prevent obstruction of light from the instrument for which the frame is intended. The best frames are those in which the two halves are hinged at one edge and on the opposite edge there is riveted a fold of metal that clips the two parts together after the color medium has been inserted. Temporary frames can be cut from cardboard and held together with paper clips. One should be careful in selecting lighting instruments to reduce the number of color frame sizes necessary to be carried in stock.

Masks and Funnels: A mask is a sheet metal or cardboard slide placed within the guides of a spotlight to change the shape or size of the illuminated area. A mask may be of a single piece with a hole cut in it or of two pieces to allow an operator to change the size and shape of the illuminated area at will. One expensive professional mask is made like the iris diaphragm of a camera that allows one to change the diameter of a round opening from full size of the lens down to a pin hole or "black out." An approximation of this can be made of two pieces of cardboard with a triangular notch in one edge of each. As explained in Section 2, the Pevear Tormentor Hood is made with framing masks at top and bottom of the lens opening and with flippers at each side of the opening for the purpose of masking and changing the distribution of light. A funnel is a most useful accessory to prevent spill-light (caused by reflections from the walls of a spotlight) from appearing outside the illuminated area, such as spill-light from beam spotlights falling on the teaser or proscenium arch. The funnel is a cylinder of sheet metal from twelve to thirty inches long with some arrangement for attaching it to the instrument for which it is intended. It must be painted flat black inside and out.

Stage Cable: A stage cable is a flexible twin conductor which consists of two bundles of fine wire each twisted into a heavier wire like a cotton cord constructed from fine threads. Each of these conductors is covered with insulating material consisting of rubber and cotton fabric. The two insulated conductors are finally covered together with more insulating material to form a single flexible cable. The safe size for such uses on the stage as connecting spotlights, floodlights, and any other movable instrument whose total wattage is 1500 or less, is the No. 14 wire, which safely carries 15 amperes.

All nonprofessional workers should be warned against using cable of current carrying capacity less than the current through the load. It is both illegal and unsafe. For example, No. 14 wire is unsafe for arc spotlights because they draw from 25 amperes up to 100 amperes, or occasionally even more. Where the wire or cable is subject to heat, asbestos covered wire is essential. Any of the lighting equipment companies listed in the appendix can supply all sorts of stage cable. A short table of wire sizes with corresponding ampere capacities is listed here for convenience. A more complete table can be found in any handbook of wiring practice and in some catalogues of lighting equipment.

Gage No.	Maximum Ampere Capacity
18	3
16	6
14	15
12	20
10	25
8	35
6	50

Stage Cable Connecters: Stage cable connecters are small blocks of fiber with contacts on one edge and a cable entrance on the opposite edge. They belong in pairs, a line connecter and a load connecter. The line connecter has two brass cylindrical openings which receive the brass prongs of the load connecter. These connecters are used in splicing lengths of cable together, to connect the short asbestos leads from a spotlight or floodlight to a length of cable, and to make any sort of connections from portable equipment to the source of electrical energy. The line connecter should always be on the "live" end (the one connected to electrical energy) of a cable and the load connecter on the "dead" end. For example, the load connecter is always placed on the short leads from the lighting instrument.

For school, college, and community theatres these connecters of fifteen ampere size are recommended to take the place of stage plugs and plug receptacles ordinarily found in professional theatres. The connecters are cheaper and their exclusive use in one size throughout the theatre and all equipment greatly simplifies the handling of cable, because all cable will then be interchangeable. The fifteen ampere size is sufficiently large to handle all ordinary incandescent loads.

Soft-Edge Devices: The sharp contrast between the round illuminated area from a spotlight and a darker area surrounding it is often distracting and inartistic if it falls on scenery, properties, or raised stage levels. To eliminate the sharp line between light and dark several "soft-edge" devices have been tried. The tormentor hoods mentioned before are provided with a square of hand-ground glass mounted between the lens and the lamp. This device is satisfactory, but the glass is rather easily broken. It is somewhat preferable, however, to allow the full intensity of light to pass through the center, gradually grinding toward the periphery of the lens. The writer has done this to a glass disc equal in diameter to the lens and placed in the lens holder behind the lens. Very fine carborundum and water (with a certain amount of manual assistance) will do the grinding. A piece of frosted gelatine containing a thin coating of oil does fairly well. Another satisfactory method is to place a piece of frosted color medium, with notches cut along the inside edge, in the color frame along the edge of the opening. This need be at the top only, if no more than the upper half of the lighted area spills on the wall of a set.

CHAPTER IV

COLOR IN LIGHT

1. *Introduction*

Color is so important in the practice of stage lighting that it seems advisable to treat it in a separate chapter in order to develop the subject step by step from theory to practice. That we all do not speak the same language in discussing color is unfortunate, but there is not so much confusion as is generally supposed, except in the names that people give to various colors. In fact, color need not be confusing at all, for the whole subject is based on science, and the fundamentals can be explained in simple terms that anyone can understand. People with training in art often have difficulty at the beginning of a study of color in light because they are constantly thinking in terms of pigments. Actually the study of the physical principles of light and color are fundamental to the study of pigments, since any pigment depends for its appearance on its ability to reflect and absorb light and on the color of the light that falls on the pigment. The fundamental principles of color, then, are the same in both pigment and light.

2. *The Spectrum*

In a discussion of color it is convenient to make frequent reference to the visible spectrum. When light is passed through a piece of glass with oblique sides, such as a triangular glass prism, it is refracted or bent away from its original direction and is separated into a number of bands of colored light called a spectrum. These bands of color are known as violet, blue, blue-green, green, yellow, orange and red, but actually the human eye can distinguish over a hundred different hues, nearly all of them lying between violet and red. The spectrum is divided into small units called microns which help considerably in preventing confusion about the actual part of the spectrum referred to when we say green or violet. If one says green between .52 and .54 microns and violet between .42 and .425 microns, there can be no doubt about the hue he has in mind. Color, however, cannot be completely described by its hue. There are two other properties of color that are to be considered in order to describe it completely.

3. *The Properties of Color*

Any color whether in pigment or light can be described in terms of its hue, saturation, and brilliance. Definitions [1] and explanations of these, which refer both to pigment and light, will follow.

Color, in general, refers to all sensations arising from activity of the retina. This includes, of course, grays and black.

Brilliance [2] is that property of any color which allows it to be classified according to a series of grays ranging from black to white. The brilliance of any surface, then, depends on the illumination on that surface. For example, one might increase the illumination on a red surface until it is a tint of red, a red of very high brilliance. Or one could lower the amount of illumination on the red until it would actually be black. A color of very low brilliance is sometimes called a shade.

Hue is that property of any color which distinguishes it from gray of the same brilliance. While the word color is often used as a synonym for it, hue is such a common term that almost everybody is familiar with it. As was explained above, it is often designated in microns by its position in the spectrum. It may be said, for example, that the hue of a color is blue or red or green, more accurately green between .52 and .54.

Saturation [3] is that property of any color possessing hue which determines its degree of difference from gray of the same brilliance. That is, gray is a completely unsaturated color in pigments, and white light is also completely unsaturated. A color in light which is completely undiluted or completely free from its complement (defined in Sect. 4) is completely saturated. Pink, is a partly saturated color, or a color of low saturation, which is produced by adding blue-green to red. This process can be considered also as one of neutralization (if white light is neutral), in which case pink is a partly neutralized red.

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[1] These definitions are similar to those of the Colorimetry Committee of the Optical Society of America, 1922.

[2] Painters sometimes substitute the word value for brilliance.

[3] Intensity is a synonym for saturation that is in common use among artists.

One can describe or designate any color, accordingly, by these properties of color—hue, brilliance, and saturation. Vague terms like those applied to colors in women's hose and dress goods may be appropriate for advertising purposes, but people in the theatre who work with each other upon technical and artistic problems involving costumes, scenery, and lighting need an accurate terminology such as that suggested above. Slovenly and inaccurate terminology is all too common among workers in the theatre.

4. *Color Mixture—Additive*

In the opening sentences of this chapter it was said that white light can be separated into the colors of the spectrum, and that conversely, white light can be produced by putting these colors together. One can produce white light, furthermore, by mixing only three of them, blue, green, and red. In fact by mixing two or three of these, almost any color can be synthetically produced, and accordingly they are called primary colors. Mixing red and green results in yellow, red and blue make magenta, and green and blue produce blue-green. This additive method of color mixture, as it is called, is illustrated by the equilateral triangle in Fig. 17. By mixing colors that lie at an apex and at the mid-point of the opposite side, blue and yellow for example, white light will result. Such pairs of colors are called *complements.* In fact *complementary colors* might be defined as two colors which when mixed produce white light. When there is considerably less of one of the complements than of the other, an unsaturated color is the result. For instance, when green and magenta are mixed and there is more green than magenta, the product will be an unsaturated green.

The principle of additive mixture of color is applied in striplights wired in three circuits, each circuit producing light of a primary color (see Chap. III). Then by changing the intensity of the lamps in each of the circuits at the controlboard, various mixtures of color can be made in the general illumination. Again, an additive mixture is produced when two spotlights with different color media are covering the same area.

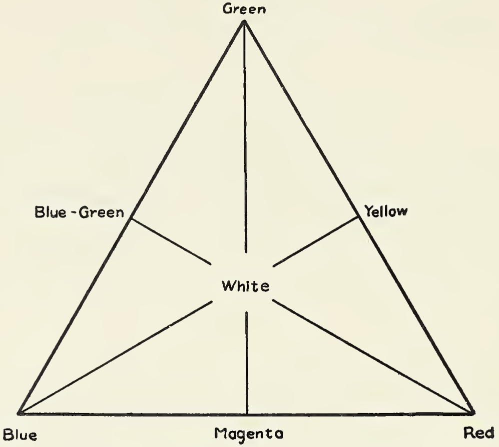

Fig. 17. Additive Mixture of Color

5. *Color Mixture—Subtractive*

Colored light on the stage is produced in the first place by the source, which is nearly always the incandescent lamp. This light is somewhat low in the blue end of the spectrum and a little high in the red end, resulting in light that is a tint of yellow high in brilliance. While this is strikingly different from noon sunlight, we are so accustomed to using this yellow light that we think of it as white light unless there is something more nearly white with which to compare it. Basically all colored light, as we think of it in the theatre, is produced subtractively by selective transmission and absorption. If, for illustration, white light falls on a blue color medium, the rest of the spectrum is absorbed, and blue light only is transmitted. If the white light were made synthetically of blue and yellow, the medium would still let blue go through and absorb the yellow. That is, it selects part of the light to pass through and absorbs the rest; hence the terms selective absorption and selective transmission that are in common use. Endless examples are to be found, but let us consider two primaries. White light falls on a blue medium and only blue goes through. If a red medium is placed in the path, blue light falls on it, and since a red medium allows only red to pass, no light goes through the combination of a red medium placed over a blue one. If a yellow medium is over a magenta one, red and green (the two primaries that produce yellow) as well as yellow go through the first and fall on the magenta. Now since magenta will pass red and blue only, the single color that will pass through a yellow and magenta combina-

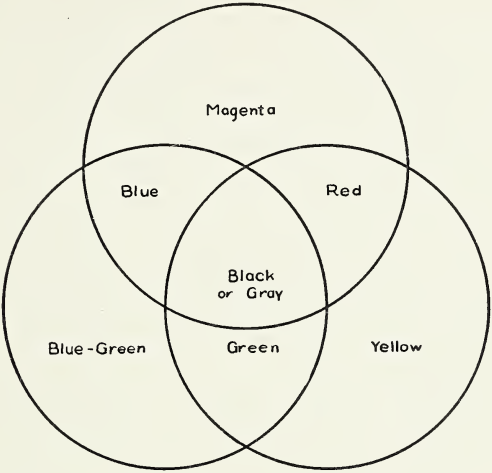

Fig. 18. Subtractive Mixture of Color

tion is red. Thus, light behaves by subtraction as is further illustrated graphically in Fig. 18. In Fig. 17 the mid-points of the sides of the equilateral triangle are called secondaries. These secondaries, blue-green, magenta, and yellow, are mixed by subtraction as in the example above in which yellow and magenta were mixed (by superimposing) to produce red. Referring again to Fig. 18 it will be seen that the other two primaries may be made by mixing the secondaries, just as red was produced by superimposing yellow and magenta color media. The circles in the diagram should be considered as three pieces of color media. Another way of thinking of this matter of transmission and absorption is in terms of what part of the spectrum each color medium transmits. This is done simply, for theatre purposes, by examining the media with which one ordinarily works, by means of a pocket spectroscope (see the sections on the media themselves for specific information). In using gelatine for colored lighting one occasionally needs to superimpose media to get just the desired color, but in using cellophane one is constantly needing two or more different media to produce the right color.

Equally important in stage lighting is selective reflection. A color is selective in its reflection by virtue of its property of reflecting only a part of the light that falls upon it, and, of course, absorbing the rest of the spectrum. For example, theoretically a blue pigment[4] reflects blue light and absorbs almost all the remaining part of the spectrum. If red light falls on the blue surface, the red will be absorbed because blue pigment reflects only blue (in practice this is not true in the case of every hue of blue and is not true of tints). The result will, accordingly, be black. Further examples will be used in discussing colored light in relationship to scenery, costumes, and make-up.

6. *Color Media*

A highly desirable method of producing colored light has never been discovered or invented, and we are still using make-shift methods and troublesome color media that are far behind the rapid strides made in the perfection of control equipment during the past three years. In the following paragraphs little more can be done than show advantages, disadvantages, and preferences in what is available at the present.

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[4] No pigment, unless it is very dark, reflects only one hue; most pigments reflect a large part of the spectrum.

7. *Glass*

Glass is in general use for borderlights, footlights, and other striplights of recent design, and most of the glass media is made to fit the round opening in the individual reflectors of these striplights. The best glass is heat resisting, of good permanent color, and not easily broken. It is, indeed, a joy for one who has fussed with flimsy gelatines and lamp dips for many years. Glass is expensive in first cost, but in the end, for instruments producing general illumination, it is best and cheapest. True, glass is available in only a few commercial colors like blue, green, red, yellow, amber, and perhaps one or two others, but these are all one needs for color mixture in general illumination. Its spectral purity is satisfactory for all but very special purposes. Glass that is more nearly monochromatic is available at greater cost, but it is not always so durable, and therefore not so useful in everyday service.

8. *Lamp Dip*

Lamp dip is not recommended for the reasons mentioned in Chapter III and because it burns off in a short time if the lamps are of more than fifty watts. It is useful to keep a little of it in stock, however, for dipping an occasional lamp for a backing striplight or for a similar use. To apply this coloring material one submerges the bulb part of the lamp in a small can of the liquid for a few minutes. It will dry more rapidly, however, if the lamp is lighted. One can make the lamp darker by redipping when it is partly dry.

9. *Gelatine*

Gelatine is the color medium in most common use. It costs between fifteen and twenty-five cents for a sheet about 20 x 22 inches. The advantages of gelatine are its low cost and great variety in colors; in fact over a hundred different ones. Its degree of spectral purity is fairly low, but there are other more serious disadvantages. Many of the colors fade in a short time; all of them are badly affected by heat and humidity. In fact, gelatine is very fragile when too dry, and it costs more than one realizes because of its low mechanical strength. A few years ago a number of dealers, in New York in particular, agreed on common numbers and names for the various gelatine colors in order that customers might be saved confusion and disappointment in ordering them.

10. *Transolene*[5]

Transolene is a newer and more expensive color medium, which is used considerably where price is not of primary importance. In small quantities it costs about fifty cents a sheet, but this is offset by some of its superior qualities. Heat and humidity have little or no effect upon it, and its mechanical strength is superior to that of gelatine. There is, however, much less variety in color in transolene than in gelatine.

11. *Cellophane*

Cellophane, a Du Pont product with which everybody is familiar because countless articles are wrapped with it, is frequently employed as a color medium for the stage. Sheets four or five times the size of a gelatine sheet cost about thirty-five cents, but using several thicknesses of the same color or two or more different colors superimposed is often necessary. This reduces the price advantage considerably. Cellophane has another advantage over gelatine, however, in its higher mechanical strength, and, in the opinion of the writer, it fades less rapidly. The reason for using several thicknesses of the same or different colors is that cellophane is made in seven or eight colors only. Under the supervision of the writer, two graduate students of the University of Iowa, Nellie Bishop and Charles Pedri, have made a comparison of cellophane and gelatine with a spectroscope and a photometer. They selected thirty-five of the most useful standard gelatine colors and simulated the hue of each with cellophane. In some cases it was necessary to use as many as six thicknesses of cellophane to make it near the hue of the gelatine; the average was about two or three. In every case, furthermore, the gelatine allowed more light to pass through; in a number of cases the difference was not significant, but in many others, cellophane allowed little more than half the light to pass through. In spite of these disadvantages, however, it is the opinion of the writer that cellophane is a more useful and economical medium than gelatine largely because it can be used many times without breaking. The fact that cellophane is about as inflammable as newsprint seems to cause no trouble; heat from a 1000 watt lamp, at least, does not endanger it.

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[5] Another medium of this sort, called "Transpara," has recently appeared on the market.

12. *Efficiency of Color Media*

A surprising amount of light is lost or absorbed in passing through color media. Dark media like the primaries, red and green, transmit eight to twenty per cent and blue from five-tenths to eight per cent. Unsaturated colors, such as daylight blue, pink, and light amber, transmit from fifty to seventy-five per cent. Considering that less than fifteen per cent of the light from a lamp within a spotlight goes through the lens, it is evident that a very small amount reaches the acting area after going through a dark blue medium. This is one of the reasons why unsaturated colors are to be used for the acting area when possible. Another reason for preferring them is that saturated colors, as will be shown in the following section, distort make-up and costumes and tend to give them an unnatural appearance.

13. *Light and Costume*

Although it is rarely done, the color of the light should, by all means, be considered in designing costumes. Using colored light in the dye room, or looking at the material through small pieces of color media will help a great deal to prevent redyeing after the first dress rehearsal. In general, unsaturated light is much safer than full saturation to use on period costumes that are made of several colors, but even with unsaturated light, colored costumes can be considerably affected. For example, a yellow costume can be grayed or neutralized by even daylight blue light, and it will be black in saturated pure blue light. The reverse is also true. A blue costume is grayed by light amber illumination, and a comparatively pure yellow-orange light will make the blue look absolutely black. Generalizing, one can say that a light of complementary hue will gray a costume, but light of a similar hue will enhance the beauty of a piece of fabric and make it more prominent. Blue light on blue velvet or satin makes it seem to glow from within. In dimly illuminated scenes costumes should be of tints if possible, because they need to reflect more light than the background, while in well lighted scenes saturated hues and shades may also be included. The designer of costumes, all will agree, should have a thorough mastery of color in light as well as color in fabrics.

14. *Light and Make-up*

One who is responsible for the lighting of a play is often held responsible for deficiencies in make-up, but make-up is really the actor's problem, and he should include in his training a little consideration of the way light affects his appearance. In general, foundation make-up has more red in it than normal flesh color, because much amber light has been common on the stage. Heavy foundations now are out of style, because lighter colors, like daylight blue, very light amber, and pink, are in more general stage use. Surprise pink, or illusion pink, is a flattering color medium which passes all of the spectrum but yellow. For this reason, it takes away sallowness and emphasizes the pink pigment in the actor's face.

The following simple suggestions about make-up and colored light may prove useful.

Amber light adds a yellow tonality tending to make the complexion sallow, and reduces the contrast between rouge and foundation. More rouge or rouge with less orange in it is necessary.

Red light is reflected by rouge and foundation equally leaving the actor apparently with no rouge. More rouge slightly toward the blue is necessary in red light.

Blue light has the opposite effect. Red reflects little or no blue light; therefore in blue light, rouge on the cheeks appears as two black spots. A very light foundation with only a trace of rouge is best in blue light.

Green light gives the face an unearthly appearance and should be avoided unless the play demands such an appearance.

Professional actors and even experienced nonprofessionals are very familiar with these suggestions, but a surprising number of players lack even a trace of information of this sort.

15. *Light and Scenery*

The radical lighting artist is of the opinion that scenery is merely one of the reflectors that he needs in making a design in light. While most scenic artists would probably disagree, this is, from a technical view at least, essentially true, and in this way it will be considered for the moment. Ideally, acting area light should be kept off the scenery, but reflections from the floor and spill-light influence its appearance to some degree. As in the case of costumes, scenery must be designed and painted for specific color in lighting. Otherwise it will never look as it was intended. Scenery, as most people in the theatre know, should almost never be painted a flat color, but by one technique or another several colors should be applied, so that definite spots or small areas of each color lie near each other (see Part Two, Chap. V). When light falls on the whole surface, each small area reflects certain parts of the spectrum, and the reflected light mixes additively before it reaches the eye at some distance away in the auditorium. If the primaries, blue, green, and red, were painted on the surface in this way and illuminated with white light, the surface at a distance would seem to be gray, but very different from a uniform gray paint covering the whole surface. The one with the three colors would have texture, variety, and beauty, while the solid color would be monotonous. If the three colors were illuminated with red light, blue and green would reflect none and the appearance at a distance would be a dark red uneven surface; uneven, because of the areas reflecting no light. By changing the color to blue, then, the color of the surface would seem to be dark blue. Scene changes are sometimes made by changing furniture, draperies, and the color of the light when the walls are painted in this manner. This is not, however, so simple, as it sounds. The primaries are rarely used, if ever, but several colors more appropriate to the particular design are used along with a color in light added to the surface to emphasize the dominant color in the paint.

Monks cloth and other neutral gray materials used as draperies for the stage are easily colored by means of striplights and floodlights with appropriate color media. Because of their sheen and the interesting highlights and shade when hung in folds, silk, satin, and rayon look well in colored light. All of these materials should be hung in folds in order to attain variety in light and shade. If light from opposite directions is of different colors, one can have shadows of two different colors and a mixture of these colors in the highlights.

By carefully selecting pigments that have a distinctly different appearance in two or more colors in light, spectacular effects are possible for the right occasion (not usually for drama). As an illustration, one can draw two sketches on white paper, one with blue chalk and one with orange or red chalk. In blue light the blue chalk and the white paper are equally blue because each reflects blue light to about the same degree; so the blue sketch disappears. The orange chalk, reflecting little or no blue light, appears black and stands out boldly. In red light the orange or red chalk disappears and the blue sketch appears. Very amusing cartoons can be made in this way and changed by changing the light. One might paint a drop according to these principles and change a woodland scene from summer to winter. If the sky were light blue and the leaves of the trees green or blue-green, the leaves could be made to disappear by using green or blue-green light. Such things have to be very well done to have any measure of success, and such a drop could not be shown in its entirety. If only a part of it were seen through windows, it might be satisfactory. In general, though, such things are too spectacular for drama, but belong to musical comedy and revues, where smart effects are always in demand.

Good designers should know the relationship of light to pigment so thoroughly that they think in terms of light even when using pigments. Sorrowful is he who paints a set for amber light and discovers later that it is for a night scene.

16. *Conclusion*

This is merely an outline of the principles and practice of color for the stage, but it will serve as a starting point for those who are just beginning. Color is probably the most important and difficult of all lighting problems but it is also the most fascinating and exciting. A little study, more sensitivity, and much practice will bring results.

CHAPTER V

LIGHTING CONTROL

1. *Introduction*

For the present, perfect control of light in the theatre may be defined as complete control of the properties of light—quantity, color, and distribution—from a single position within easy reach of an operator in full view of the result. To approach perfection in ideal control, a place must be provided for the operator somewhere in front of the proscenium with every element of control as conveniently within his reach as the keys of an organ console are to an organist. Where, then, should this position be? In the Chicago Civic Opera the controlboard is under the front of the stage, so that the operator can look through a hole in the footlight recess. In the Earl Carroll Theatre, and in Severance Hall at Cleveland, the board is in the orchestra pit. The controlboard in the larger theatre at Rockefeller Center is in a concealed position below the stage level, between the curtain line and the orchestra. Viewing the stage from the footlight position gives one a somewhat distorted impression because he is too close to see the performance in normal perspective. A better place is farther away from the stage, such as the rear of the auditorium, the position of the controlboard in the University Theatre at the University of Iowa. If the balcony is not too high, a place almost equally good is behind the last row of seats in the balcony. From either of these last two positions an excellent view of the stage is presented to the operator, who can follow every change in mood and movement as easily as the audience. The only disadvantage in the "out front" position is the necessity for communication by telephone with the stage-manager and head of the light crew. This rarely, if ever, causes any difficulties. The more conventional or traditional location for the controlboard, left or right back stage near the proscenium arch, may be satisfactory for vaudeville and road show theatres, but for repertory or production theatres, as well as for college, school, and community theatres, a location of complete visibility for the operator multiplies the opportunity for effective lighting many, many times.

It is highly important that the location of the controlboard and its dimensions be known before the final plans for a new theatre are approved. To the perpetual sorrow of the owners many theatres have been built without realization of the depth of a controlboard and the space behind it necessary for repair. In fact, there are notable examples of placing the controlboard in an undesirable place different from the one intended, because someone did not fully understand this structural problem.

2. *General Classification*

In general, there are two methods of lighting control, permanent and flexible. *Permanent control* is the one in which the wiring from any outlet on the stage, such as the wiring for a borderlight circuit, to a switch and dimmer on the controlboard is permanently fixed with no provision for connecting that outlet to any other circuit on the board. This method of control has grown out of antiquated lighting practice and the associated tradition of equipping theatres with stock lighting instruments, such as footlights, borderlights, and stage pockets for spotlights or floodlights on floor stands. These in the past, were thought to be the backbone of lighting any production, and accordingly were always permanently connected to the controlboard. As a result, in recent years the majority of road companies have carried their own lighting instruments and portable controlboards and have completely ignored the permanent stage lighting equipment in the theatres on the road.

3. *Flexible Control*

Modern practice in stage lighting requires much more variety and flexibility in an equipment layout, especially for experimental theatres, than the permanent method of control allows. For a number of reasons, then, a method of control has come into use that is far

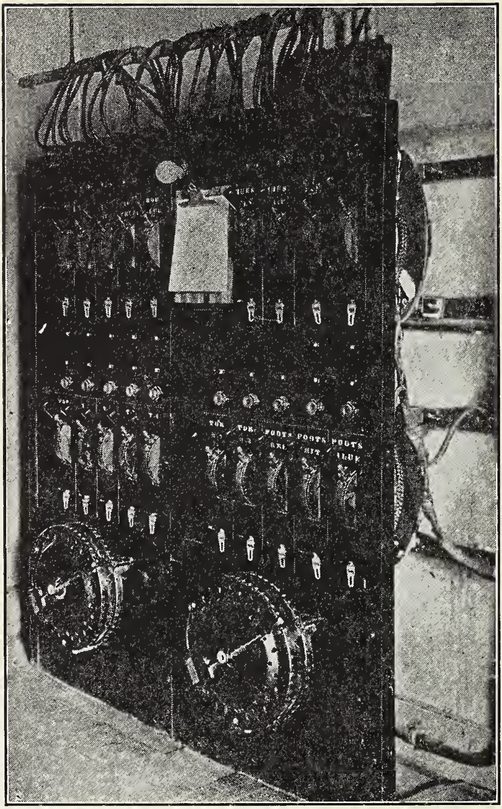

Fig. 19. Switchboard in the Playmakers Theatre, University of North Carolina

Master dimmer control designed by Charles E. Graham and Samuel Selden.

better suited to little theatres. It is called *flexible control*, which means that between the controlboard and the outlets where instruments are connected, there is some means of connecting any outlet to any dimmer and switch on the controlboard. Furthermore, any number of outlets can be connected to one dimmer if desirable, as it often is. On the board in Fig. 19 there is a row of line connecters each one representing a dimmer circuit. From each outlet on the stage a cable leads to a rack shown above the board and terminates in a load connecter. Enough free cable is allowed so that any outlet connecter will reach any dimmer circuit connecter. Figure 20 shows an interconnecting panel which illustrates the same principle. The forty-eight horizontal bars are connected to the forty-eight outlets on the stage, and the twenty-eight vertical bars shown behind the horizontal ones are connected to the twenty-eight dimmer circuits on the controlboard. In order to connect any one or more stage outlets to which spotlights, footlights, or other instruments can be connected, to any one of the dimmer circuits, one moves a sliding connection along the outlet bar until it is directly in front of the desired dimmer bar. Then he pushes the sliding contact forward until it slips over the dimmer bar making a tight connection between a lighting instrument somewhere on stage and a dimmer circuit on the controlboard. By means of some such interconnecting arrangement, flexible control has the following advantages to little theatres. In order to save time and inconvenience in connecting instruments to stage outlets, to save using a large amount of stage cable, and to avoid excess cable being in the way of the actors and the shifting of scenery, it is necessary to have considerably more stage outlets than are ever needed for one production. These outlets are located in convenient places about the stage in order to plug in instruments wherever they may be needed. On the other hand it does not follow that one needs an equal number of dimmer circuits on the controlboard; in fact the number of dimmer circuits is often only half the number of outlets, but these figures must be determined by workers in their own theatres who know from considerable experience the actual needs for the sort of plays commonly produced there. The number of dimmer circuits never should be determined by a manufacturer or dealer who thinks he knows what the theatre needs. If the most useful wattages are selected, from twenty to thirty dimmer circuits take care of fairly elaborate productions in little theatres. The number of stage outlets, however, is determined somewhat by the size of the stage, but forty to sixty is a rough estimate of a convenient number.

The following advantages are also important. In this kind of control a dimmer of any wattage found on the board (any good board has dimmers of different wattages) is available to any outlet, and a single dimmer can be connected to two or more outlets, a practice which is frequently necessary. Furthermore, a flexible controlboard is much cheaper because fewer dimmer circuits are necessary than in permanent control in which several dimmers may be idle because they are permanently connected to an instrument not in use at the time. Finally, flexible control allows the operator to arrange the controls into groups according to the needs of each production, so that he can handle the switches and dimmer

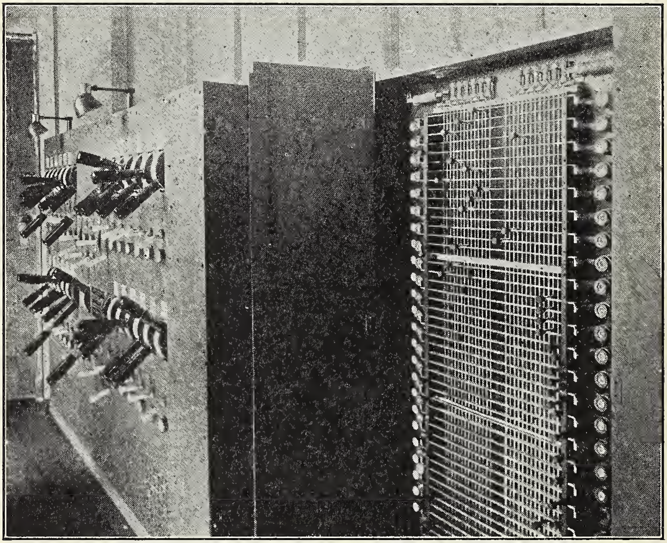

Fig. 20. Interconnecting Panel

handles with maximum speed and facility and with minimum danger of error.

4. *Direct and Remote Control*

Controlboards are classified, also, as direct or remote control. In direct control, the switches that the operator actually handles carry the total current that passes through the lamps. Especially in a main switch, the current may be quite high, perhaps two hundred amperes or more, and the size of the switch has to be accordingly large. Large switches are less easy to handle than small ones, and if many switches have to be large, the whole controlboard is enlarged beyond desirable limits. In remote control the circuit carrying a heavy current is broken by what is called a contactor (it takes the place of a large switch), placed in some remote place in the basement. Since the contactors are operated magnetically, only a small current is necessary to open and close them, and accordingly small switches are placed on the controlboard to be manually operated. Controlboards on which only a few circuits carry a large current, such as main and sub-main switches, have remote control for these circuits only, and are called modified remote controlboards. Full remote control is too expensive and unnecessary for small experimental theatres. It has made possible, however, a type of board called pre-set, in which the lighting for one to ten scenes can be set up in advance and the whole set-up for a scene can be turned on with a single switch. This pre-set type of controlboard has been much overrated by the manufacturers, and while it may be an asset to vaudeville and presentation cinema theatres, it is a waste of money for little theatres. Only occasionally in the production of plays is there an advantage in being able to set up one scene in advance of the scene being played; elaboration of a controlboard to set up five to ten scenes at once is a frill designed more for high pressure salesmanship than for economic usefulness. In fact, the whole truth of the matter is that there is little if any advantage in being able to set up switches in advance if the dimmers cannot be set in advance also. Setting both in advance is possible, however, on the very recent and very expensive boards, such as the one in Severance Hall in Cleveland, and the two controlboards in the Radio City theatres in New York.

5. *Electricity*

Since this analysis of stage lighting does not contain a chapter on electricity, a few paragraphs inserted here will aid the beginner in understanding the following sections on controlboards.

Electricity is a natural force which man has learned to control and put to well known everyday uses. It behaves according to simple laws that are easily understood. Electricity is explained commonly by comparing it with water flowing through a pipe. Just as pressure is required to make water flow through a pipe, so pressure is necessary to make electricity flow through a wire. This pressure on the wire is called electromotive force or voltage and is measured in units called volts. Water being forced through a pipe is called a current of water; likewise when electrical pressure, voltage, is applied to a circuit of copper wire, a current of electricity flows in this wire. The rate of flow of current is measured in *amperes*. Unlike water, electric current will not flow through a single wire from source to point of consumption, but a return wire back to the source is always necessary. For example, two wires run into a building and continue to a wall outlet in a room. In order to have light, two wires must lead from a lamp socket to this outlet. Before the lamp is screwed in place, there is electrical pressure or voltage on the wires, but no current will flow until the circuit is complete through the filament of the lamp when the lamp is screwed into the socket. In a similar way wires go from the street into a theatre building. They branch off to serve many lighting purposes, but for the stage the wires continue to the stage controlboard. When a lighting instrument including a lamp is plugged into a stage outlet, the circuit is complete from a source of electrical energy outside of the theatre through a wire to the controlboard, where the current continues to flow through a dimmer and switch out to the lighting instrument, through its lamp and back to the source of energy by way of a second wire making a complete circuit.

Resistance. All substances can be divided into conductors and non-conductors of electricity. Non-conductors are often called insulators. Common insulating materials used on the stage include fabric, rubber, fiber, and porcelain. Copper wires are covered with fabric and rubber to prevent electrical contact with each other and to prevent fire and harm to human beings. Copper is the cheapest good conducting material and consequently is in general use for wiring of all kinds, but no material is a perfect conductor. A perfect conductor would offer no resistance to flow, but just as pipes of different lengths and different diameters offer various degrees of resistance to flow of water; so do wires of different size, length, and material offer greater or less resistance to electric current. The practical unit of resistance is the ohm. A conductor is said to have a resistance of one ohm if a current of one ampere is forced through the circuit by a pressure of one volt.

Ohm's Law. There is a simple relationship between current in amperes, resistance in ohms, and electromotive force in volts called Ohm's Law which applies to electrical circuits. According to Ohm's Law, the product of the current and resistance equals the voltage.

$$\text{Volts} = \text{Amperes x Ohms}$$

Using the symbols, E for electromotive force in volts, I for current in amperes, and R for resistance in ohms,

$$E = IR$$

By means of this simple equation it is easy to calculate any one of the three quantities if the other two are known. For example, find the current which will pass through 1000 feet of copper wire with a resistance of two ohms per 100 feet? The voltage is 110. If there are two ohms in 100 feet there will be 20 ohms in 1000 feet.

$$I = \frac{E}{R}$$

$I = \frac{110}{20} = 5.5$ amperes, the amount of current which will pass through the wire.

As stated above, electricity flows only when there is a complete circuit from the source of power through the power-consuming device, such as a spotlight on the stage, and back again to the source. Electrical parts can be connected in two important ways: in series or in parallel. A series circuit is a group of electrical parts, such as lamps, rheostats, etc., connected so that the current passes from one to the other and finally back to the source from which it started (see Fig. 21). Since series circuits are not common on the stage they will be omitted from the present discussion. While in a series circuit there is only a single path for the current, in the parallel circuit there are as many paths for the current as there are elements or parts. That is, the current divides and a part of it goes through each element and back to the source. In Fig. 22 a number of lamps is in parallel. In fact each lamp might be considered to have a separate circuit of its own since it burns independently of the others. In a series circuit if one lamp burns out, none will burn. In the parallel circuit the current may be different in each part (according to the wattage of each lamp in a lamp circuit), but the voltage is the same in all the parts. The total current is the sum of the current in all the parts.

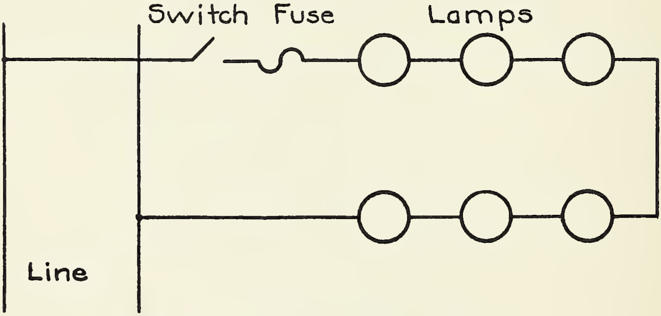

FIG. 21. SERIES CIRCUIT

Power. The watt is the unit of power, and it is equal to the product of amperes and volts.

$$\text{Watts} = \text{Volts} \times \text{Amperes}$$
$$W = EI$$

If the wattage and voltage of a lamp are known, the current can be determined by means of this relationship. When the current is known, the proper wire size for connecting the lamp can be obtained from a table (see Chap. III, Sect. 8).

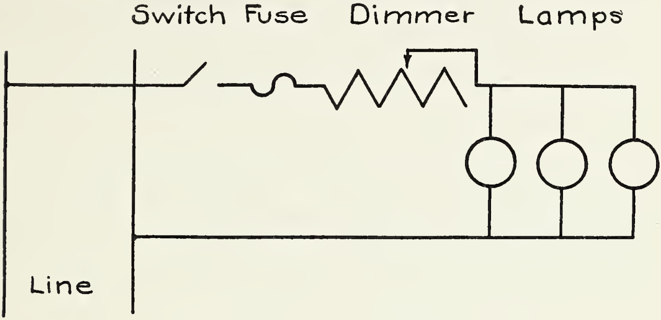

FIG. 22. PARALLEL CIRCUIT

Problem. Find the current and resistance of a 500 watt 110 volt lamp.

$$EI = W$$

$$110I = 500$$

$$I = 4.54 \text{ amperes passing through the lamp.}$$

Then by Ohms Law

$$R = \frac{E}{I}$$

$$R = \frac{110}{4.54} = 24.2 \text{ ohms, the resistance of the lamp.}$$

If it is desirable to dim this lamp completely, a dimmer of 3.5 times the resistance of the lamp will be necessary, that is, about 85 ohms. The dimmer is connected in series with the lamp or group of lamps which are in parallel among themselves (see Fig. 22).

6. *Controlboard Parts*

A discussion of the way in which controlboards operate is difficult without brief mention of the essential parts of which these boards are composed. The vital essentials for controlling the intensity of an incandescent lamp are a switch to open and close the circuit, a fuse to protect the circuit from short circuits or excessively high current, and a rheostat, or dimmer, for the purpose of changing the amount of illumination.

Switches: The smallest durable switch which is silent in operation, easy to operate manually, and which has been approved by the fire underwriters, is usually the best for stage controlboards. Snap switches like those used for wall switches in dwelling houses should never be used for the stage.

Fuses: Either plug or cartridge fuses are satisfactory for stage lighting. The plug type which screws into place like a lamp has the advantage of displaying the fact that it is either intact or "blown." These, however, are not made in sizes above thirty amperes. Cartridge fuses are small cylinders of fiber with brass contacts on the ends. Their size varies with the current to be carried. Circuits should never be overfused; in other words, a circuit carrying current for five hundred watts should have a six ampere fuse, not a ten ampere one. The six ampere fuse would "blow" if a thousand watt lamp were connected to a five hundred watt dimmer, warning the operator that an overload had been placed on the dimmer; the ten ampere fuse would not have given this warning.

Dimmers: Almost every person actually associated with the production of plays appreciates the supreme importance of a method of changing the intensity of light on the stage. Persons who need to be convinced are local architects and electrical contractors and school principals and superintendents. Apparently it is not difficult to delude them into buying elaborate apparatus for making footlights disappear, and three or four borderlights thirty feet long, when one, merely fifteen feet in length, is sufficient for the average high school stage. The smooth salesman from the metropolitan scenic studios comes in for his share of the loot when he convinces the school board that a few painted drops, a charming little set of foliage borders and wood wings (model 1885) should be added to the general utility set with the living-room on one side and the kitchen on the other—all for the neat total of some fifteen hundred or two thousand dollars of the community's hard earned money. But when a means of controlling the borderlights is discussed, all that the budget will stand is a tin box with a few snap switches in it fastened to the wall in an inconvenient place. The money thrown away on antiquated scenery and superfluous borderlights would have purchased an adequate if modest controlboard with sufficient dimmers for doing good work in lighting. This is no exaggeration for dramatic purposes. Hundreds of these cases exist in almost every state, and many new ones are added every year.

Electrically, dimmers are of three principal kinds, reactance, auto-transformer, and resistance. Since the reactance type is very expensive and not in common use in small theatres, it will be omitted from the discussion entirely, and the electrical principles involved in the other two dimmers will be omitted also to simplify the discussion.[1]

7. *Resistance Dimmers*

In shape, resistance dimmers are either square or round plates, or are square in section, varying in height from about twelve to twenty inches. The last are often called slide dimmers from the sliding contact which runs from top to bottom. Slide dimmers are shown in Fig. 26 and the round plate type in Fig. 23. The round plate type can be interlocking or non-interlocking. The slide type is always non-interlocking. Interlocking means that the handles which change the intensity can be connected in such a way that two or more dimmers set in a row can be operated together by a single handle called the interlocking handle. Fig. 23 shows how interlocking dimmers are mounted in rows in a steel frame. The two large handles near the center of each row are called the interlocking handles. These dimmers have one hundred and ten steps, so that they will dim very gradually, and each handle is provided with a scale of ten, so that the desired quantity of illumination controlled by the dimmer can be noted and recorded for succeeding rehearsals or a performance. The non-interlocking dimmers have about thirty or forty steps only, which does not produce such smooth dimming, and there is no scale provided for noting a dimmer reading. The price of non-interlocking dimmers, however, is only about half that of the interlocking ones. When the most rigid economy must be practiced even at considerable sacrifice in result, the cheaper ones are recommended if used with master dimmers.

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[1] See Selden and Sellman, *Stage Scenery and Lighting*, pp. 306–307.

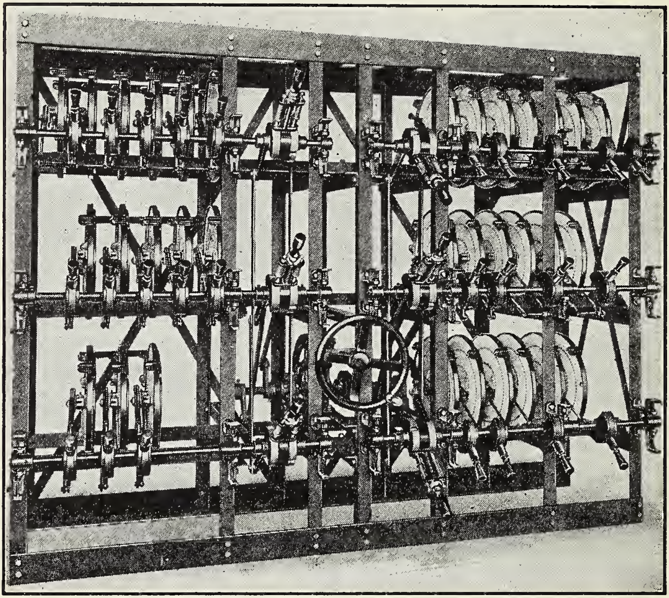

Fig. 23

A bank for Ward-Leonard dimmers before it has been set in a switchboard. The interlocking shafts, master handles and slow motion wheel are clearly shown.

Multi-capacity Resistance Dimmers: For stage outlets into which spotlight or floodlights of various loads are plugged, dimmers of various ratings are needed. This is taken care of somewhat with a flexible controlboard, but if the circuits are permanently connected, a multi-capacity dimmer is needed. These so-called dual or multi-capacity dimmers have, for example, resistance enough to dim a 500 watt lamp "black out" and current capacity to control a 1000 watt lamp. They are also made in 250 to 500 and 1000 to 2000 watt capacities. The disadvantage, however, lies in that the control handle will have moved only two-thirds of its travel when it has completely dimmed a lamp of maximum wattage for the dimmer. This restricts gradual dimming to a degree. Nevertheless, some of these, especially those of 250–500 watt rating, are highly recommended for flexible controlboards, although all of the dimmers on the board should not be of this type.

8. *Auto-transformer Dimmers*

Very recently a new dimmer has appeared on the market using the auto-transformer principle which has been common in electrical engineering practice for many years. It consists of a coil of copper wire surrounding an iron core. At one end of its cylindrical form is a dial (much like a large dial of an old model radio) to which is fastened a carbon brush, or sliding contact, which is manually moved around the coil of wire. In this piece of apparatus there is no heat loss and practically no energy is used by the dimmer. Its

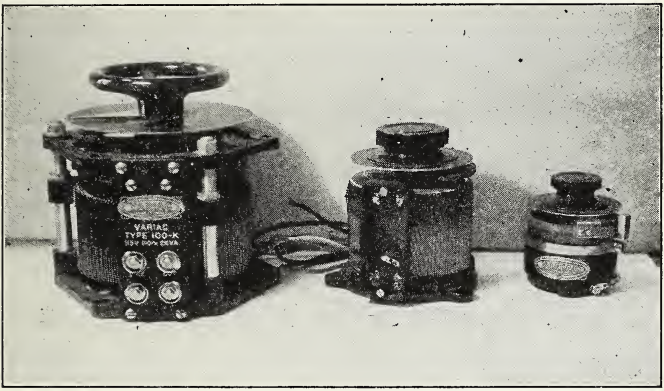

FIG. 24. AUTO-TRANSFORMERS

chief advantages, however, are that it is small and compact, and that it has complete variable capacity. That is, an 850 watt dimmer will dim completely and gradually any wattage, even a five watt lamp, up to its maximum capacity. The manual operation of the resistance dimmer is a matter of arm movement which makes subtle changes in illumination rather difficult, but in the case of the auto-transformer, operation is by finger movement, which increases the opportunity for the more delicate touch that allows the most subtle of changes.

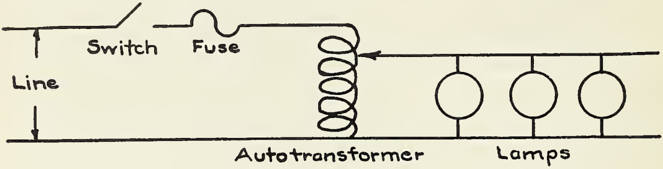

Fig. 25. Method of Connecting Auto-transformer

At present only two sizes are being made in this country that are useful for theatrical purposes. There is a 5 ampere size capable of a maximum wattage of 850 and a 20 ampere size, which will dim about 2200 watts. These are made by the General Radio Co., but other manufacturers are becoming interested in this type of dimmer. They have been used in Germany for several years. Auto-transformer dimmers are illustrated in Fig. 24, and the way they are connected for use is shown in Fig. 25. This dimmer is equally useful in portable controlboards and in the stationary variety. They can be used on alternating current only, while the resistance dimmer can be used on either direct or alternating current.

9. *Master Dimmers*

With a master dimmer one can do electrically what is done mechanically by the interlocking mechanism used with interlocking dimmers, and it has an additional feature which makes it superior. If one desires to change the intensity of six groups of lamps simultaneously by means of non-interlocking dimmers, three operators would be needed. If there were fifteen or twenty dimmers, quite a large crew would be necessary for this purpose alone. Fortunately, a master dimmer, connected in series with all of the individual dimmers and circuits to be controlled, will accomplish this task of dimming all of these circuits together, and it can be operated by one man. This master dimmer must have a wattage capacity equal to the total wattage of all the load connected to it.

A small controlboard wired for flexible control is sometimes divided into two groups of circuits, each group having a number of individual dimmers controlled by a master. A single operator can manipulate two handles simultaneously, and two masters are superior to one in that one group can be decreased in intensity while the other is being increased. This is possible, however, with a controlboard wired for flexible control only (see Sect. 2).

The important feature which makes a master dimmer superior to mechanical interlocking is called proportional dimming. Suppose a master dimmer were connected to four individual dimmers which were set at different readings, "full up," one-fourth dimmed, one-half dimmed, and three-fourths dimmed. With the master dimmer one could dim this group proportionally, that is, change the intensity of the whole group without changing the relative intensities of the lamps controlled by these four individual dimmers. Proportional dimming is a very valuable addition to any controlboard, especially when one uses three color striplights (see Chap. 3).

10. *Panelboards*

An inadequate but common means of lighting control often used on the stage of a school, college, club, or lodge auditorium is called a panelboard. A panelboard is composed of a group of snap switches and fuses mounted in a steel cabinet (similar to those used in dwelling houses). A panelboard is comparatively cheap and is satisfactory for its intended purpose, a board for buildings where the light is turned on and off once or twice a day. Intended for purposes very different from the quiet operation necessary for even the most modest of dramatic productions, these panelboards are designed for further ineffectiveness by local contractors who know nothing of the methods of lighting a play.

Such a controlboard could be very much improved by connecting or reconnecting the switches, so that they would be arranged in groups with a master switch for each group. For example, house light switches should be together, and a master switch placed beside them to control them all at once. A stage master, also, is very important, and it should control the stage lights only; neither the house lights, exits, nor anything else which the designer happened to hang on it in a moment of mental aberration, should be included. Dimmers, of course, should be built within (or beside) a panelboard used for stage lighting, but panelboards with dimmers

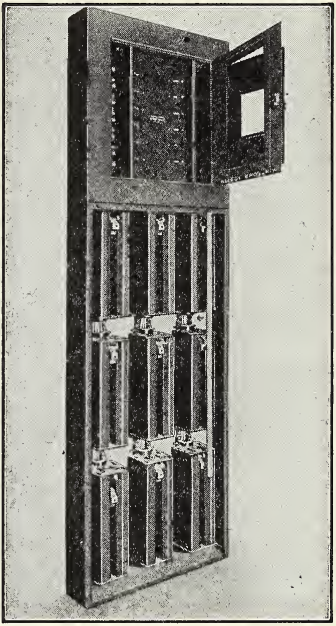

FIG. 26. PANEL BOARD WITH SLIDE DIMMERS

are exceedingly rare (see Fig. 26). A method of connecting dimmers temporarily to a panelboard is suggested in Sect. II.

11. *Dimmer Connections*

In discussing controlboards wired for flexible control it was stated that in such boards any stage circuit could be plugged into any dimmer circuits on the board. Getting dimmers of different capacities into any stage circuit can also be accomplished by approaching the problem from the opposite direction. Instead of having the dimmers connected to the controlboard feeders, the stage circuit can be directly and permanently connected to the feeders with a means provided for plugging the dimmers into the various stage circuits. Designs have been made and permanent stage controlboards built with devices for connecting dimmers in the manner just mentioned, but this method is more suitable for portable nonprofessional controlboards and for connecting dimmers to panelboards and switchboards without dimmers.

For either purpose a convenient length of twin conductor of sufficient current carrying capacity is connected to the terminals of the dimmers. To the other end of the conductor a common split plug (not a stage plug) is connected if the fuses on the board are plug fuses. A plug fuse is removed from the circuit on the controlboard and the dimmer plugged in its place. This places the dimmer in series with the lamp load, as it should be. Since it is now common practice to use only one fuse in each circuit, another fuse in the dimmer leads must be provided when the fuse is removed from the board. If one wishes to plug dimmers into a board made for cartridge fuses, the dimmer leads can be soldered to the ends of a "blown" cartridge fuse which is to be plugged into the fuse clips in place of a cartridge fuse. In the case of the auto-transformer one must be careful to put the plug in place in the right way. It is not reversible like a plug connecting a resistance dimmer.

12. *Portable Controlboards*

When a little theatre organization produces plays in inadequately equipped buildings that are used by others, it is desirable to own a portable controlboard that can be stored or made inaccessible to others. They are often much cheaper than stationary boards because it is unnecessary to have the same degree of finish and refinement commonly associated with controlboards that are a part of a theatre building. The operating parts can be placed in a strong box or trunk with a cover to protect the contents in transportation or to prevent curious persons from damaging the contents.

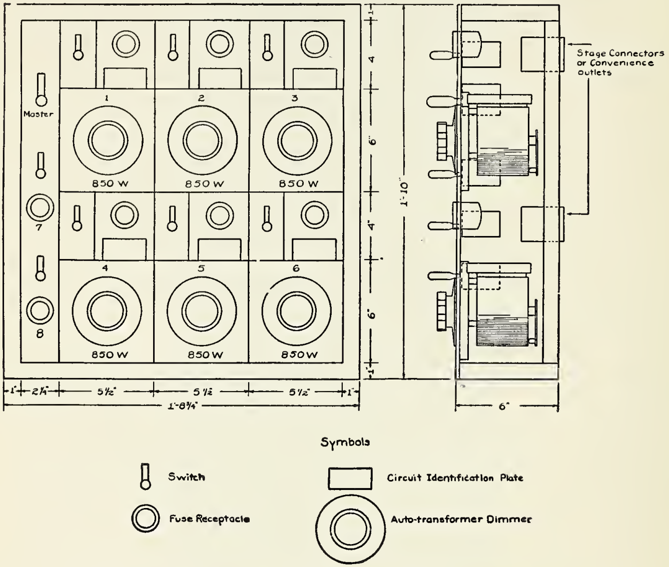
Master
1
2
3
850 W
850 W
850 W
7
4
5
6
8
850 W
850 W
850 W
1"
4"
6"
4"
6"
1"
1'-10"
1"
2¼"
5½"
5½"
5½"
1"
1'-8¼"
6"
Stage Connectors or Convenience outlets
Symbols
Switch
Fuse Receptacle
Circuit Identification Plate
Auto-transformer Dimmer

Fig. 27. Diagram of Portable Controlboard

Fig. 27 shows a small portable controlboard that could be built from materials costing no more than approximately one hundred and forty dollars, or less if one used cheap switches and convenience plugs instead of standard stage connecters. This portable board consists of the following parts: six 850 watt auto-transformer dimmers ($14 each); eight individual switches and one master;

eight plug fuse receptacles and fuses; a fuse cut-out and cartridge fuses for the master switch; sixteen "line" stage connecters of fifteen ampere size; a frame or box in which to mount these parts; and sufficient wire of the proper size to connect the parts. Figure 27 shows the front and end view of this portable controlboard. The fuse is placed next to the switch and dimmer that it protects in each case because this is the most convenient and easily located position. The fuses for the master switch should be placed on the back because the live parts of the cartridge fuses are exposed. The total current of this board is about fifty amperes and only cartridge fuses are available in sizes over thirty amperes. Two line connecters for each of the eight circuits are provided on the rear of the board, so that two lighting instruments can be connected to each of these circuits without using a multiple connecter. The dimensions of the board are based on the use of a five ampere auto-transformer called a Variac by the manufacturers, General Radio Co. of Cambridge, Mass. Obviously other dimmers such as any of the several types of resistance dimmers can be made into a desirable portable controlboard, but this type is now considered superior. The dimensions of the switches mean very little since there are a great many types and sizes available. A small knife switch might be used if covered with a sheet-metal housing, but since the type of dimmer recommended will dim the lamps completely regardless of the size of load (up to their maximum, of course), the common toggle switch that makes a snap might be satisfactory. The loss in power is so very small in the auto-transformer that one might omit the individual switches entirely and depend on the dimmer for turning the light off when necessary.

Eight circuits with six dimmers seems inadequate to those who are accustomed to elaborate equipment, but a recent survey of the high schools of Iowa [2] indicated that a third of the schools reporting had no dimming control at all and that very few had enough to light the average play satisfactorily. It is safe to assume that this condition does not obtain in Iowa alone, but is probably typical of nearly all of the states in the country. It is high time that a means other than the production of plays be found for supporting high school athletics, and that money spent for equipment for the stage be more intelligently distributed. In more than a few schools this small portable board would improve the quality of the performances of plays.

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[2] This was a part of a thesis in stage lighting by Charles Pedri under the supervision of H. D. Sellman, in which recommendations of lighting equipment were made for high schools of three sizes. The portable controlboard described above is similar to the one recommended to the group of schools with the smallest stages.

Portable controlboards are connected to a source of power through a "company switch" if one is available. This is a switch placed in a small metal cabinet, or sometimes on the stage controlboard, and is provided with terminals or a large line connecter to connect the portable board. The "company switch" is connected in the main feeder or in a sub-feeder from the controlboard. In a panelboard one may have to tap the three wire feeder within the panel to obtain a source of power for a portable controlboard.

13. *Small Stationary Controlboard*

In order to illustrate the process of planning a small inexpensive controlboard which is not intended to be portable, the front view and a wiring diagram have been included in Figs. 28 and 29. This controlboard has twelve individual dimmers and two master dimmers, and because the dimmers are limited to so few, four dimmerless circuits are added. The wattages of the individual dimmers, which are shown in the front view, were selected because they seem to be the most useful in general practice. These should, however, be very carefully and thoughtfully selected according to the instruments in stock or contemplated for purchase in the near future by the person most intimately associated with the lighting of plays produced by the organization that is purchasing the controlboard. In addition to the individual dimmers two master dimmers are provided. Two masters are preferable to one because of the added flexibility suggested in Section 7. While these two master dimmers are rather large to be used as individual dimmers, if desired, they could be used as individual dimmers also by providing a transfer switch with two throws, one for master and one for

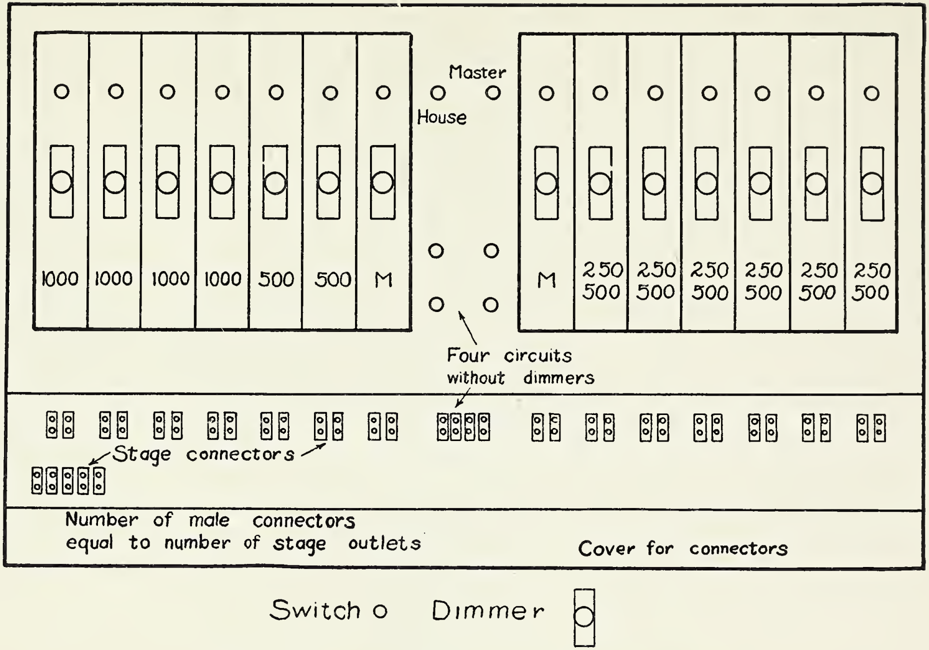
1000
1000
1000
1000
500
500
M
Master
House
M
250 500
250 500
250 500
250 500
250 500
250 500
Four circuits without dimmers
Stage connectors
Number of male connectors equal to number of stage outlets
Cover for connectors
Switch
Dimmer

FIG. 28. DIAGRAM OF STATIONARY CONTROLBOARD

individual. Several experimental theatres, such as the Yale University Theatre and the University Theatre at the University of Iowa, have master dimmers that can be transferred to individuals in this way. Each of the large rectangles in the upper part of the front view in Fig. 28 represents a unit of control, while a small circle near the top represents the individual switch for a circuit; the larger circle enclosed by a small rectangle represents the dimmer handle; and below this a numerical value represents the wattage of the dimmer. Between the two groups of six circuits each is a house light switch and a master switch for the whole board shown above in the drawing, and below, four switches to control the circuits having no dimmers are indicated. At the bottom of the board is the interconnecting panel which should have a hinged cover made of steel. The fuses are often placed in this panel in order to save the expense of a separate fuse panel. Occasionally fuses are placed on the front of the board just below the dimmer handle with each fuse in the unit it is to protect. In the diagram, it is suggested that standard stage connecters be used in the interconnecting panel, but various kinds of plugging devices are being used for this purpose. In the upper row are the line connecters, two for each dimmer circuit, so that two instruments might be placed on one dimmer when needed. The connecters are placed directly below the circuit they represent in order to prevent confusion and error in setting up the controlboard for a performance. The lower row contains load connecters, each being wired to one of the stage outlets, so that the number of male connecters will equal the number of outlets on the stage. Each connecter in this row must have a number or name, such as floor pocket left number one. These connecters, furthermore, must have enough free cable to allow them to be pulled out and plugged into any one of the connecters in the row above. As explained in Section 2, this panel makes it possible to connect any outlet to any dimmer or more than one outlet to a dimmer if it has sufficient wattage. Fig. 20 shows a neater and more compact interconnecting panel containing a sliding and plugging device that works on exactly the same principle. The wiring diagram is very simple and is self-explanatory

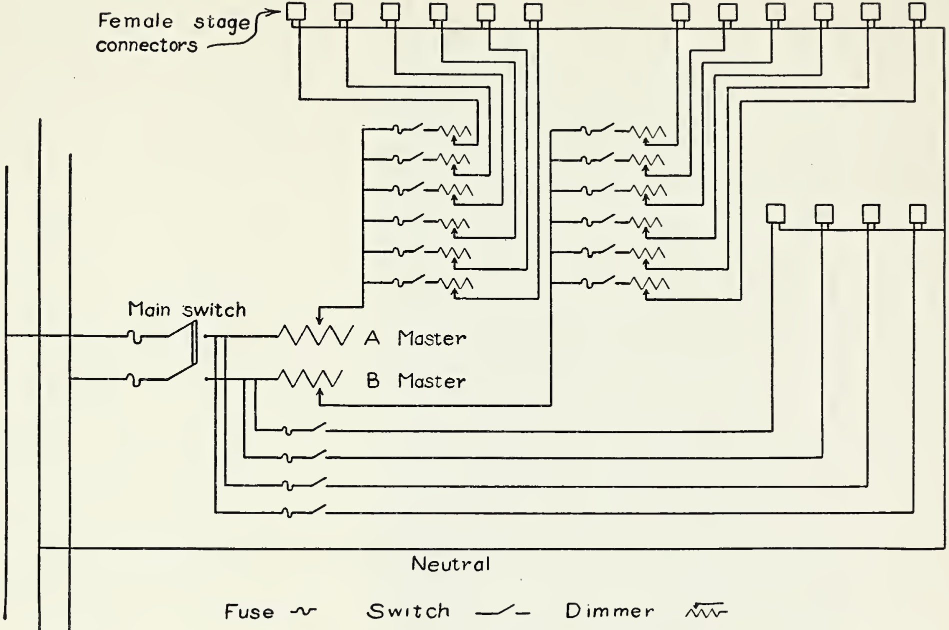
Female stage connectors
Main switch
A Master
B Master
Neutral
Fuse
Switch
Dimmer

Fig. 29. Wiring Diagram of Stationary Controlboard

for anybody who has an elementary knowledge of electricity and who understands the diagram in Fig. 22.

It must be clear to all that a controlboard with twelve dimmers is insufficient to do elaborate lighting, insufficient in fact to light the plays discussed in Chapters II and VI in the manner in which they were lighted. On the other hand, this controlboard is far superior to those in many small theatres in colleges, high schools, and communities. Being moderate in price, this controlboard should appeal to the theatre with limited funds, and it will certainly improve the lighting in many such places.

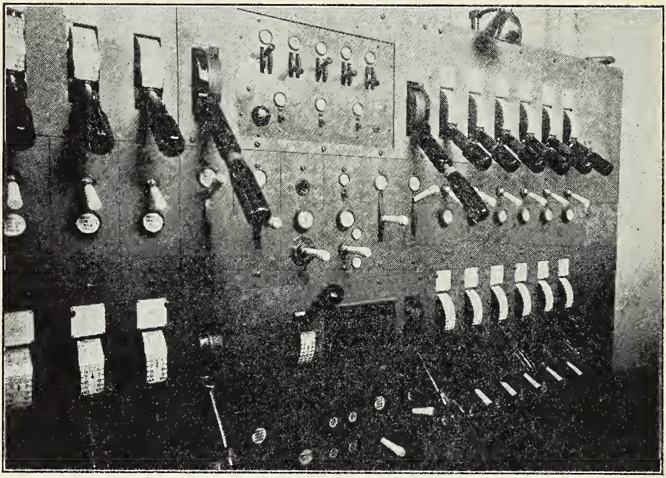

Fig. 30. Iowa University Theatre Controlboard

It should be perfectly clear to the reader now that little theatres should never allow a manufacturer or dealer to plan or design controlboards. These manufacturers and dealers are never familiar with the problems and practice of the particular theatre that is in the market for a new controlboard, and many of them have little or no idea of how plays are lighted. For example, while many nonprofessional theatres have been using master dimmers for at least fifteen years, the manufacturers have only recently discovered them and rarely recommend them to little theatres. Furthermore, many of them have never heard of an interconnecting panel, and some of them refuse to make a board in which such a panel is included. There are several, on the other hand, who are very sympathetic and eager to build a controlboard according to any specifications that will meet the Code [3] requirements. It is to these manufacturers that little theatres should turn when they are about to purchase a new controlboard, but a clear concept of their exact needs, including the number of circuits and dimmers and the manner in which the board should operate, is highly essential. Otherwise the manufacturer will probably tell the little theatre what it needs, but more than likely the little theatre will soon regret having taken this advice.

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[3] National Electrical Code.

CHAPTER VI

SPECIFIC LIGHTING PRACTICE

1. *Introduction*

After having analyzed light for the stage, outlined a plan for its use, and discussed lighting instruments and then control, there remains the problem of putting these things into practice.

The first thing to do, of course, in designing the lighting for a play is to read, in fact study thoroughly, the text of the play, thinking in terms of light and the emphasis on its functions for this particular problem. Then the person in charge of the lighting should confer with the director and the designer of the settings and costumes. After this the scene sketches should be examined carefully, and then a graphic record of the lighting plans should be made. This graphic record is usually called a light plot.

A complete light plot consists of a ground plan and vertical section of the stage setting with clear intelligible indications of the light distributions on the acting area, the set itself, and the background. The two drawings should include also the location of the various instruments that are to provide this distribution. In addition there should be placed either in these diagrams, or in tabulated form, a list of the instruments and their wattages and the color media to be placed in the instruments for each scene. Figures 31, 33 and 35 show light plots for an interior and an exterior.

2. *Lighting an Interior*

The setting for which the light plot in Fig. 31 was made is shown in Fig. 32. It differs from the conventional box set in that it consists of a living-room and a hall with an indication of an archway between. In form it is not otherwise unusual. There is a fireplace down right and a curved staircase in the center of the left wall. Other elements are obvious in the illustrations. The proscenium opening is twenty-six feet wide and twelve feet high, while the depth of the set is approximately thirteen feet.

One finds in studying *Moor Born,* a play by Dan Totheroh, based on the lives of the Brontë sisters, that although none of the functions can be slighted, perhaps the emotional and psychological one needs most emphasis. The old house in which the Brontë family lived was a cold shadowy place with very dark walls, and the hall was dark even when the sun was shining. The only warm spot was in front of the fireplace. The mood of the play is cool, somber, and hopeless in some respects, but the play is not actually unpleasant. In this case light is assisted in creating the mood by the moor wind that blows with variations in force but without interruption throughout the whole performance. The designer of the set in the first place builds the basic structure by catching the mood and fix-

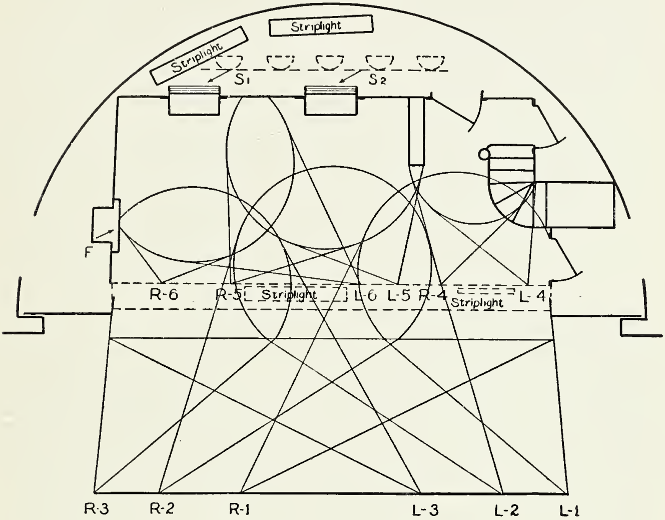
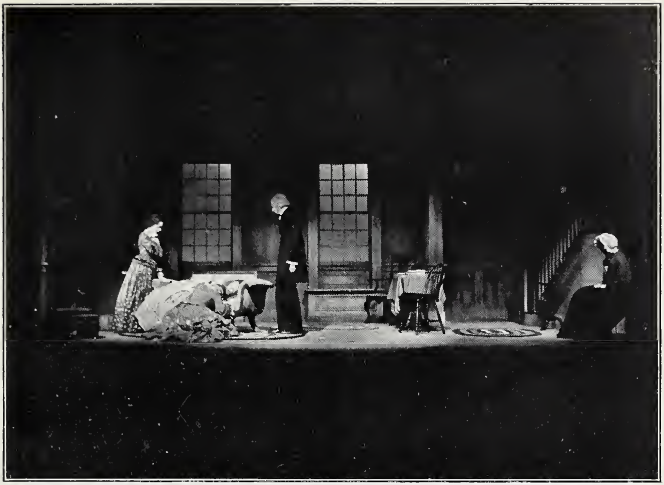


FIG. 31. LIGHT PLOT FOR *MOOR BORN*

ing it in the form and painting of the set, thus producing the right reflector for light. In the present case the prime coat of paint (see Part Two, Chap. V, Sect. 6) was an unsaturated green (gray-green) with several spatters of green, blue-green, and violet on it. The set was extremely dark at the top and gradually became somewhat lighter toward the floor making it possible to have deep shade in the corners of the set and near the ceiling. In fact, since the ceiling was also dark, it was hardly possible to see where the walls joined the ceiling when the illumination was set at the proper level.

The visibility for the acting area had to be sufficient to see clearly the actors' faces, but the illumination on the areas was no more than one-half to two-thirds that of a smart comedy. This low level of illumination also contributed to the mood. The specific illumination for the acting area was directed from two groups of spotlights with eight-inch lenses, six in each group. The six that covered the down-stage areas were mounted in the beam position and contained 1000 watt lamps. They were focused on the three areas in the conventional scheme discussed in Chapter II. The mounting and distribution were slightly different for the up-stage areas, because the projecting wall partly separated areas four and five. This caused R4 (see Fig. 30) to be moved farther stage left than usual to prevent the separating wall from cutting off a portion of the illumination. These instruments, mounted on the teaser batten, contained 500 watt lamps. The focus and location of these acting area spotlights and the fact that each was separately controlled by a dimmer made it possible to change the quantity and distribution continually, keeping the area around the fireplace brighter when it was built up, raising the intensity where candles or lamps were placed, and in general changing the illumination in the different areas to point the focus of attention, keeping the areas darker that were not in use, and building with the movement of the play. The color of the specific illumination was violet and daylight blue for the scenes in daylight and at night pink near the fireplace, amber and daylight blue near the oil lamp, and daylight blue and violet in the hall. The color of this light contributed to both the psychological function and that of the representation of nature.



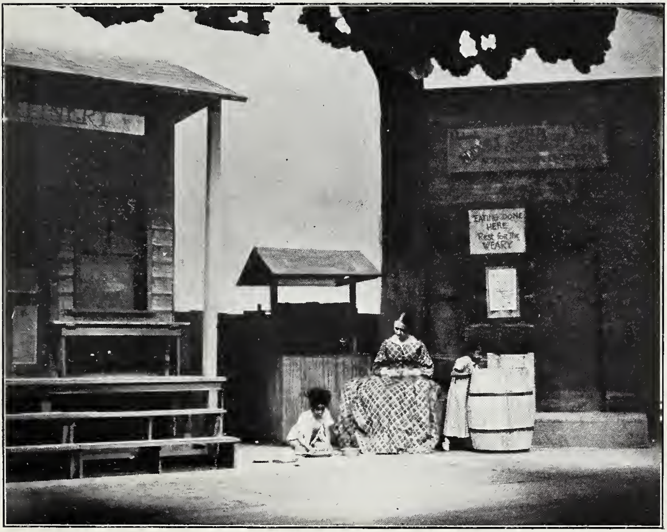
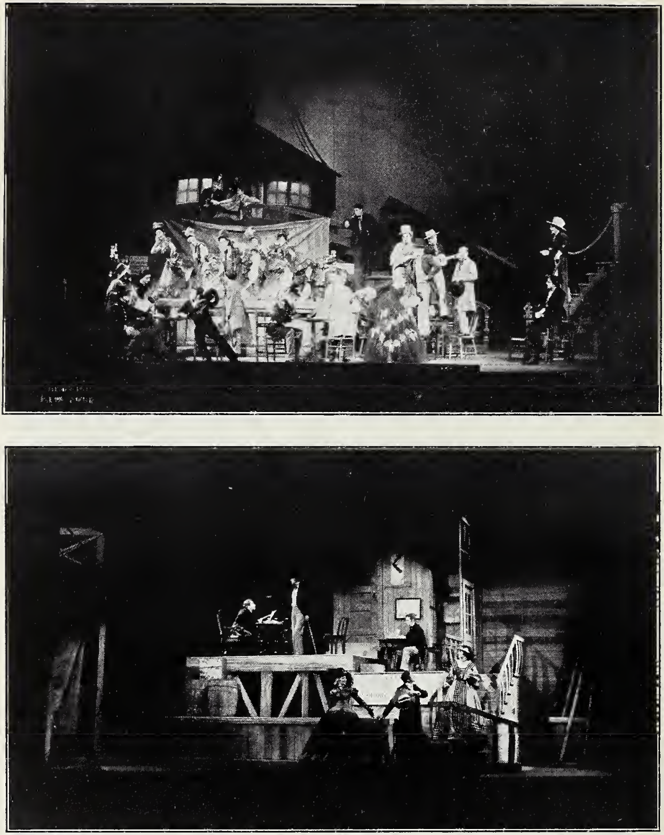


Fig. 32. The setting for *Moor Born* by Dan Totheroh at the University Theatre, University of Iowa, where the première was made under the direction of E. C. Mabie. Setting by Mildred Sutherland and lighting by H. D. Sellman. The darkness of the walls is intended to contribute to the mood of the play.

Fig. 34. The setting for *In the Shadow of a Rock* by E. P. Conkle, produced for the first time at the same theatre. Directed by E. C. Mabie, designed by A. S. Gillette and lighted by H. D. Sellman. Notice the foliage projected on the building at the right with a lens projector.



Vandamm

Two of a series of scenes designed by Donald Oenslager for Melvin Levy's *Gold Eagle Guy,* produced by the Group Theatre. The basic element in the various settings was a large, movable platform. Changes of scene were effected simply by moving the platform, shifting a few set pieces and properties, and altering the lighting.

The general illumination was produced by two striplights placed on the teaser batten [1] as shown in Fig. 31. Having the left one farther left than normal for a conventional box set made it possible to control the hall lighting separately from that of the living-room and to keep it dark most of the time. This striplight was of the type used for backings and had only one circuit with daylight blue lamps of small wattage. Naturally they were very dim all of the time. The other striplight was six feet long wired in three circuits with blue, green, and red color media over 150 and 100 watt lamps like those discussed in the section on cyclorama base lighting. This source, likewise, was kept very dim in order to keep the walls dark and to be in harmony with the mood of the play. The blue and green circuits were used in the daylight to produce a cool tint on the walls that would not spoil the mood and would also conform to the natural light from the outside. In the light scenes all three circuits were used with less emphasis on the green, which would produce a tint of violet.

As was explained in Chapters I and II, these two kinds of light combine to accomplish the second function, revelation of form. In this particular lighting plan greater contrast between the specific and general illumination made the shadows and shade deeper, giving a greater sense of form and an indication of sorrow and sickness in the faces that was needed for the characterizations.

No backing light was needed in the two interior doorways in the left wall. In the right wall there was a fireplace containing fire logs and a baby spotlight with the front removed (see Chap. III, Sect. 7). Within was a 250 watt lamp and over the front was placed a color medium made of a daylight blue, with small pieces of red and amber cellophane glued over the surface in an irregular manner. Such a medium gives a fairly good illusion of firelight.

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[1] In the production shown in the photograph a bridge was used instead of a teaser batten. A bridge is a light steel structure sometimes made of steel pipe which is often used to take the place of a teaser batten. The bridge is usually as long as the proscenium width and is about twenty-four inches wide, so that operators may walk on it in adjusting and mounting instruments. A bridge contains more places for mounting instruments than a single batten and makes adjustments between scenes more convenient. Most bridges are hung from the gridiron by means of steel cables.

This source illuminated the actors' faces with light slightly warmer than any other source when they sat in front of the fireplace. The weak sunlight, called for in the script, was produced by two 250 watt baby spotlights mounted on a batten just above the two windows indicated in Fig. 31, at S1 and S2 and in Fig. 33. The color medium used was very light amber, and the intensity was just high enough to produce a highlight on the window thickness and a faint pattern of window muntins on the floor and old secretary in the corner up right. The cyclorama overhead was illuminated by means of six cyclorama floodlights mounted on a pipe batten several feet above the windows. The lamps were five hundred watts wired in two circuits one for daylight blue and one for dark blue. The two colors were alternated on the batten to make a more even distribution. For the daylight sky the light blue was used alone, but the

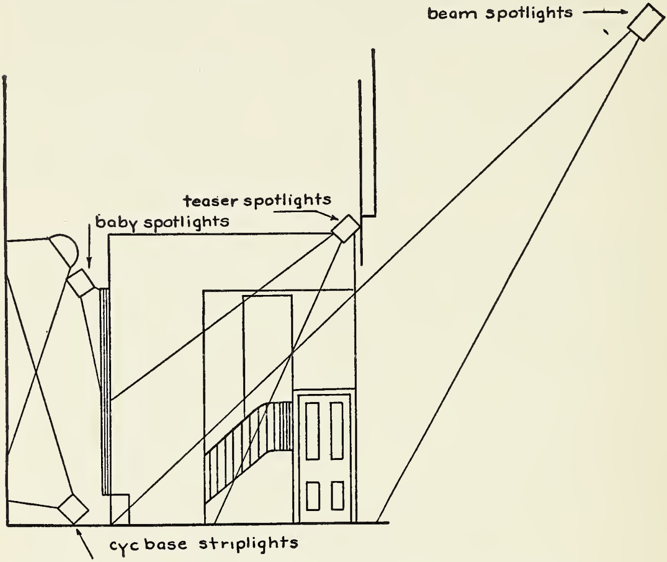

FIG. 33. LIGHT PLOT (SECTION)

night sky required, as it nearly always does, a mixture of the two with, naturally, more dark blue than light. Mixing the two blues prevents that glaring saturated blue so commonly seen in poor cyclorama lighting. The base of the cyclorama was lighted with two striplights identical with the border striplight mentioned above. In the daylight scene all three colors were needed, with less red than green and blue to produce a tint of blue. In the night scenes, no red was needed and less green than blue. This completes the description of the lighting of *Moor Born* according to the photograph and the light plot in Figs. 31, 32 and 33. The longitudinal section Fig. 33 shows the vertical angles of the beams of light produced by the spotlights, and the relative heights of the mounting positions of the instruments. In this way it supplements the light plot in the ground plan. Photographs give one some idea of the lighting of a play, and the light plots are quite necessary in planning the lighting. It should be obvious that only the simplest things can be constructed without graphic plans, and no one should expect to light a play adequately which has some degree of complexity in its lighting requirements without placing on paper at least a rough indication of intentions. These light plots, unfortunately, like the photographs tell nothing of the many changes that are necessary during the course of a performance. Many of these changes have to be worked out in rehearsals, and are indicated for the most part in the controlboard operator's cue sheets.

A cue sheet consists of a set of reading for each dimmer for each scene. For example one can write the numbers of the dimmer circuits in a horizontal row and at one end a vertical row of the scenes in the play. Then opposite a circuit number and the scene write the dimmer reading. When these readings change during a scene they are sometimes done according to line cues from the play and under other circumstances, sunset changes for example, the change is worked out to run through a definite number of minutes.

In *Moor Born* and many plays with strong emphasis on mood the operator must control the light from a position where he can see the whole performance clearly and follow it with his changes in distribution, color, and quantity. It is often necessary to follow such a play with changes in light during every second of the performance, pointing the focus of attention, and creating a series of designs in light appropriate to each grouping of the players and each dramatic situation. This was necessary to a considerable extent in *Moor Born* and indispensable in *Tread the Green Grass* (see Figs. 1 and 2).

3. *Lighting an Exterior*

Another new play, *In the Shadow of a Rock,* by E. P. Conkle, will be used as an example for lighting designs in exteriors. This play is a study in character of a pioneer woman struggling to make her community a desirable place in which to live, in spite of the horse thieves and desperadoes of Nebraska in the 1850's. It might be called a play of realism which deals with an incident in slave running. The function requiring most emphasis is the representation of nature with occasional moments in which mood is closely harmonized with nature. Especially in the last scene is this true when the woman hears the story of her husband's death. This scene opens before dawn, and ends with the first tints of sunrise color as she suppresses her own sorrow to make sacrifices for others and goes on with strong faith in the future. The setting consists largely of two buildings: the one on the left being the home and millinery shop of the pioneer woman; and that on the right the general store owned by her enemy, the horse thief (see Fig. 34).

The acting area lighting was quite similar to that of the interior described above. Referring to the light plot in the ground plan in Fig. 35 one can see that the useful acting area was smaller, but that all twelve instruments for specific illumination were used. The areas are more irregular and the specific illumination overlaps more than usual. Area six is really quite small since it is merely the porch of the millinery shop, and area four is also somewhat smaller. In spite of this, the areas require light from two directions; so all twelve spotlights were used, although some were very dim at times. Because the roof of the house on stage right interfered with part of the light from R6 an additional spotlight, a small one with a 250 watt lamp was concealed under the sign and focused on the doorway. It was increased in intensity only when an actor stood in the doorway. The general illumination came from the single striplight mounted on the teaser batten between the spotlights for the up-stage areas. The color of this light varied from a tint of amber or pink in the daylight scenes, to a tint of blue at night. In each case, it was produced by mixing the three primary colors, described in the preceding chapter. The specific illumination in the daylight scenes was light amber from the direction of the sunlight, stage right, and daylight blue or pink from the left. In the night scene there was daylight blue from the moon, moonlight direction, and violet from the left.

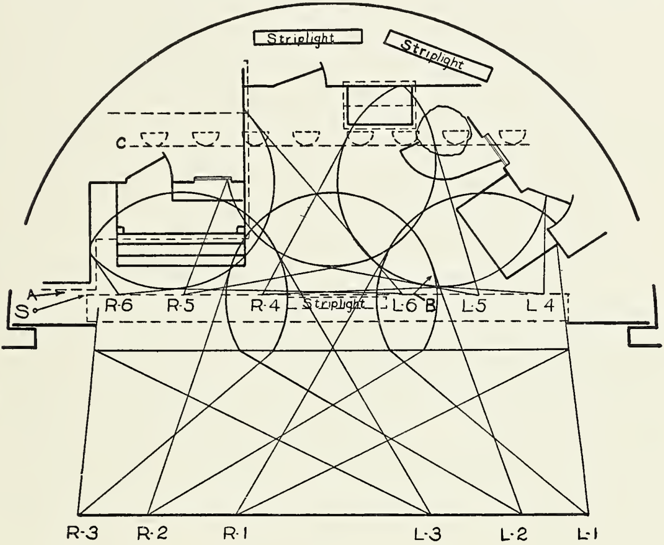

FIG. 35. LIGHT PLOT FOR *IN THE SHADOW OF A ROCK*

Inside the buildings, it was necessary to have a short striplight with a single 15 watt lamp to indicate the oil lamp within. Down right on the tormentor batten about eighteen feet from the floor an eight inch lens spotlight (S) with a 1000 watt lamp was placed for sunlight or moonlight, as the time demanded. For moonlight a medium blue served and for morning light, amber. If one looks carefully at the photograph in Fig. 34, he will see a foliage pattern on the foliage border and the building on stage left. This was placed there for decoration as well as for naturalistic purposes and indicates that moonlight or sunlight was casting shadow patterns of leaves on the building. Patterns of this sort on a foliage border give it depth, variety and character that the best painting and flat general illumination can never produce. These foliage patterns were made by a lens projection similar to a lantern slide projector. The process was described in Chap. III, Sect. 5. The slides for the projection on the left building and the roof on the right (it does not show in the photograph) were made by photographing tree foliage against the sky and printing a lantern slide from the negatives. The instruments were mounted on the right tormentor batten at A and on the teaser batten at B.

The cyclorama was lighted at the top by eight cyclorama floodlights on a batten at C. They were in two circuits alternating light blue and dark blue in color media. The lamps were 500 watts. The cyclorama base was lighted by means of two six-foot striplights in three circuits for the primary colors. These colors made possible the sunrise and sunset necessary for the play.

With the exceptions of the sunset and the dawn the lighting in *In the Shadow of a Rock* was static, as the play seemed to require. A sunset or sunrise keeps the operator quite busy, however, if he synchronizes it with the lines and keeps it moving smoothly and slowly. That the lighting is static does not mean that it is necessarily monotonous, flat, or uninteresting. In the present case special emphasis was placed on variety in light and shade motivated by the foliage patterns and the bright shaft of sunlight (spotlight at S) which in itself added highlights on the porch roof, posts, and steps. Less general illumination in proportion than usual made somewhat greater contrasts. No footlights were used.

4. *Comparison*

Now after a study of the general structure of the lighting plan, in Chapter II, and a description of the lighting of an interior and an exterior according to this plan, certain similarities and differences are to be seen. In both cases the plays chosen happened to fit into six areas, but this is not a hard fixed rule. A very small stage might well be divided into four areas, or a very large one into eight areas. For example if the acting area were thirty-six feet wide at the front it should be divided into four rather than three areas. Irregularities in the shape of box sets affect the number of areas as well as their shape. Sometimes the up-left or up-right area is completely removed by the shape of the set. In exteriors the acting area is nearly always irregular and often an odd number of spotlights is necessary.

In interiors the mounting positions for instruments is nearly always more limited than in exteriors. The walls of an interior are nearly always lashed to the tormentors at the down-stage end which prevents the mounting of instruments on a tormentor batten. On rare occasions a short return (Part Two, Chap. II, Sect. 1) is lashed to the down-stage flats at each side in order to leave a space of some eighteen inches or so open for light to pass from the tormentor position to the acting area. Physical conditions, however, often make this inconvenient or impossible. In exteriors, on the other hand, nothing is lashed to the tormentors under ordinary conditions, with the exception of a wall perhaps. This does not offer an obstruction, because the light can pass over the wall if there is sufficient height for mounting the instrument. Side lighting, so produced, along with the greater variety in the shape of exteriors, which make possible more variety in the instrument positions, helps make exteriors more exciting to light than the conventional box set. The greater opportunity for projected effects, too, adds more interest to exterior lighting. In spite of that, every play of any consequence has its peculiar problems in lighting that can be discovered if one with imagination studies the problem thoughtfully. It is so easy to turn on the borderlight and footlights and call the play lighted.

5. *Using More Limited Equipment*

Now all this may be very interesting, but what will those who have two or three spotlights, do with their lighting problems? In the first place, the fewer spotlights one has, the more general illumination he needs. If one had three spotlights, he might use one on each down-stage area from the beam position directed at an horizontal angle perpendicular to the proscenium arch. If one had six spotlights, he might add the other three to the up-stage areas in the same way. Another method of using a few spotlights is to study the play carefully in rehearsals to learn the important focal points of interest or the areas where the most important scenes are played and use the spotlights on these areas. As these scenes appear during the course of the production, one can decrease the general illumination in order to attract more attention to a special area. These suggestions, of course, are make-shift adaptations of the recommended plan, and in general will not produce results that are as effective. The reader is not to infer, however, that a larger number of instruments will always contribute to successful or aesthetic lighting. The most beautiful scenes are sometimes lighted with three or four instruments, and occasionally a play with a conventional box set requires all of the instruments one owns and all of the circuits on the controlboard.

Lack of equipment is no excuse for careless and thoughtless lighting. The more crude the apparatus the greater challenge for improvement to those who must suffer with it. Electric light is the newest thing in the theatre and accordingly the thing we probably know least about. What an opportunity for investigation and experiment! Crude as a conventional spotlight is, it is quite possible that no one has exhausted the ways in which it might be used effectively. The lighting in many little theatres can be improved by the addition or substitution of two show window floodlights, but how often have they been tried? The simplest things are often the most beautiful, and one's skill is sometimes judged by his ability to do much with little. Working with little is, indeed, the usual lot of the nonprofessional director and technician, but many are doing superior things in spite of their handicaps.

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An invaluable guide to the vast body of writings on all phases of the theatre. Every director should have a copy in his library and should consult it frequently. It should be the first recourse of every technician and artist seeking information in the solution of problems. Its annotations make it more than a mere list of books. The work is divided into four parts, as follows: Part I, Drama and Theatre; Part II, Production and Stagecraft; Part III, Pageantry, Religious Drama, Entertainment; Part IV, Anthologies, Bibliographies, Directories. There are three hundred and twenty pages filled with valuable information. The work is adequately indexed and cross referenced, making its use easy and pleasant. Because of the fullness of this work, only a select list of references is given in these bibliographies, under the various headings. Annotations are included with some of these items, but fuller annotations for most of them, including the price of each, may be found in Baker's work.

Anonymous. *Lists of Plays for School and Community.* Topeka, Kansas: University of Kansas Extension Division, 1926.

This *Lists of Plays* is typical of the guides to the selection of plays compiled by many universities for the aid of little theatres.

Drummond, A. M. *Plays for the Country Theatre.* Ithaca, N. Y.: Cornell University Press, 1922.

Another university compiled list edited by an able director.

Gamble, William Burt. *Development of Scenic Art and Stage Machinery.* New York: N. Y. Public Library, 1928.

The first and best extensive bibliography compiled for the technician and artist in the theatre. Valuable also for the director and theatre historian.

Gilder, Rosamond. *A Theatre Library: A Bibliography of One Hundred Books Relating to the Theatre.* New York: Theatre Arts, Inc., 1932.

A list of books valuable to the director and student of the theatre.

Koch, Frederick H. and Lay, Elizabeth A. (Mrs. Paul Green). *Plays for Amateurs.* Chapel Hill, N. C.: University of North Carolina Press, 1920.

One of the first and best of the university compiled lists of plays. This pamphlet was revised in 1929 with the assistance of Nettina Strobach.

Smith, Milton M. *Guide to Play Selection.* New York: D. Appleton-Century Co., 1934.

This is perhaps the best and most inclusive list of plays. It is an excellent descriptive guide to long and short, ancient and modern plays for theatre production.

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Andrews, Harry Lee, and Weirick, Bruce. *Acting and Play Production.* New York: Longmans, Green and Company, 1925.

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A book by one of the two most famous prophets of the "New Movement" in the theatre. Now out of print.

Bosworth, Halliam. *Technique in Dramatic Art* (Revised Edition). New York: The Macmillan Company, 1934.

A very practicable book, of value to both director and actor.

Cheney, Sheldon. *The Art Theatre.* New York: Alfred Knopf, 1925.

Makes a distinction between the "art theatre" and the commercial, and traces the history of the former in Europe and America. Cheney's theories should be read in the light of Lee Simonson's criticisms in his *The Stage is Set.* He holds that, like the other prophets of the "new theatre," Cheney theorizes without the facts. His works, nevertheless, are stimulating, well illustrated, and valuable.

Cheney, Sheldon. *Stage Decoration.* New York: John Day Company, Inc., 1928.

A very full record and interpretation of scenic art, with two hundred and fifty-six illustrations.

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A complete one-volume outline history of the theatre from the beginnings, with many good illustrations. Not accurate enough for the scholar, but contains valuable material for the worker in the little theatre.

Clark, Barrett H. *How to Produce Amateur Plays* (Revised Edition). Boston: Little, Brown and Company, 1925.

This book which first appeared about 1917 is one of the first American works on the subject. It is direct and practical in method.

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A full and standard history of architectural styles in the principal countries of the world, with about 3500 illustrations.

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Good Housekeeping
House and Garden
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